

1. Record Nr.	UNINA9911007160903321
Autore	Beck Tanya M
Titolo	Navigation Channel Sedimentation Solutions
Pubbl/distr/stampa	Reston : , : American Society of Civil Engineers, , 2023 ©2023
ISBN	9780784485149 0784485143
Edizione	[1st ed.]
Descrizione fisica	1 online resource (245 pages)
Collana	Manuals and Reports on Engineering Practice Series ; ; v.156
Altri autori (Persone)	BocamazoLynn BrownGary L CydzikKristina JonesCraig LambertDennis MathewRooni McAnallyWilliam H PowellNancy J PokrefkeThomas J
Disciplina	627/.23
Soggetti	Sediment transport - United States Channels (Hydraulic engineering) - United States River sediments - United States Inland navigation - United States
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Cover -- Half Title -- Title Page -- Copyright Page -- Dedication -- Contents -- Navigation Channel Sedimentation Task Committee -- Acknowledgments -- Executive Summary -- Chapter 1 : Introduction -- Purpose -- Scope -- Motivation -- Problem Definition -- Sedimentation Solutions and Prediction History -- Organization of This Manual -- Terminology -- References -- Chapter 2 : Channel Sedimentation Processes -- Dominant/Driving Forces -- Sediment Sources and Sinks -- Sedimentation Scales -- Sediment Properties -- Sediment Dynamics -- Cohesive Sediment Dynamics -- Noncohesive Sediment Dynamics -- Other Factors -- References -- Chapter 3 :

Navigation Channels and Sedimentation -- Channel Classifications -- Shallow-Draft and Deep-Draft Channels -- Inland and Coastal -- Channel Configuration and Alignment -- Channel Reaches -- Navigation Channel Sedimentation -- Off-channel Sedimentation -- Bankline and Shoreline Erosion -- Sediment Quality -- References -- Chapter 4 : Solutions to Sedimentation Problems -- Solution Strategies and Methods -- Keep Sediment in Place -- Keep Sediment Out -- Keep Sediment Navigable -- Dredging -- Adapt to Sediment Regime -- Sustainable Remedies -- Evolving Environmental Concerns -- Sustainability -- Sustainability Rating Systems -- Holism -- References -- Chapter 5 : Prediction Methods -- Field Observations -- Sediment -- Deposition and Erosion -- Hydrographic Surveys. Bathymetry is a critical component of any assessment of navigation channels and the projection of sedimentation rates. Applications of bathymetric assessment include the determination of current conditions of the channel and asse.

Dredging Records. Past dredging volumes, identified by time period and channel reach, provide useful data for validating prediction methods and establishing rough relationships between deposition volumes and environmental events such as storms and fl -- Test Pits. Digging test pits and measuring sediment accumulation in them provides an estimate of the deposition rate that may be expected if sediment supply and hydrodynamics are unchanged. However, projects such as channel enlargement or realignment -- Sediment Dating. Radionuclide dating methods for measuring sedimentation rates involve the measurement of radioactive isotope activity over depth in sediment cores (Holmes 1998). These methods can also be used for dating specific sediment strata. T -- Tracing Sediment -- Other Data -- Error and Uncertainty in Field Observations -- Desktop Methods -- General Desktop Approaches -- Trapping Efficiency. Lake and reservoir sedimentation studies sometimes employ simple trapping calculations to estimate loss of storage capacity from sediment accumulation. The technique does not directly apply to navigation channel deposition but can -- Bottom Area Method. The bottom area , or footprint method for predicting deposition rates is not recommended. It assumes that the sedimentation rate per unit area will be the same in a modified channel as in the existing channel, so the predicted -- Volume-of-Cut Method. In the volume-of-cut method (Trawle and Herbich 1980 , Trawle 1981 , Van Rijn 2013), the volume of sediment deposited in the channel is related to the volume of sediment that was removed beyond the natural depth or the depth -- Inland Channel Methods -- Coastal Channel Methods -- Machine Learning Models -- Physical Models -- Model Scales -- Moveable-Bed River Models -- Movable-Bed Coastal Models -- Fixed-Bed Tracer Models.

Physical Model Application Examples -- Numerical Models -- Numerical Model Programs -- Digital Models of Waterways -- Model Dimensions -- Model Meshes -- Model Programs Capabilities -- Graphical User Interfaces -- Uncertainty in Predictions -- Aleatory Uncertainty -- Epistemic and Structural Uncertainty -- Uncertainty Metrics from Observed Data -- Uncertainty with Limited Observed Data -- Reducing Uncertainty -- References -- Chapter 6 : Best Practices -- Problem Definition -- Objectives Statement -- Problem and Process Boundaries Delineation -- Information Inventory -- Conceptual Site Model -- Approach and Tools Selection -- Design Approach -- Identify Scale Issues -- Assess Resources -- Select Tools -- Numerical Models Application -- Model Dimensionality and Mesh -- Boundary Conditions -- Initial Conditions -- Spin-Up Simulation -- Time Steps -- Model

Parameters -- Sensitivity Testing -- Validation -- Testing -- Record Keeping -- Fitness for Use -- Interpreting and Reporting -- Monitoring and Feedback -- Managing Model Studies -- Agency Modeling Requirements -- Environmental Protection Agency -- US Army Corps of Engineers -- US Department of Interior, Bureau of Reclamation -- References -- Chapter 7 : Concluding Remarks -- Appendix A : Glossary -- Appendix B : Case Studies -- Mouth of the Columbia River -- Setting -- Need for Sedimentation Prediction -- Sedimentation Prediction -- References -- Lower Passaic River, New Jersey -- Setting -- Need for Sedimentation Prediction -- Sedimentation Prediction -- References -- Houston Ship Channel -- Setting -- Need for Sedimentation Prediction -- Sedimentation Prediction -- References -- New York/New Jersey Harbor -- Setting -- Need for Sedimentation Prediction -- Sedimentation Prediction -- References -- Norfolk Harbor, Virginia -- Setting -- Need for Sedimentation Prediction. Sedimentation Prediction -- References -- Upper Mississippi River: Thebes, Illinois to Ohio River Confluence -- Setting -- Need for Sedimentation Prediction -- Sedimentation Predictions -- Reference -- Mississippi River Ship Channel -- Setting -- Need for Sedimentation Predictions -- Sedimentation Predictions -- References -- Cape Fear River, North Carolina -- Setting -- Need for Sedimentation Prediction -- Sedimentation Prediction -- References -- Long Island, New York, South Shore Channels -- Setting -- Need for Sedimentation Prediction -- Sedimentation Prediction -- References -- Tennessee-Tombigbee Waterway Aberdeen Pool -- Setting -- Need for Sedimentation Prediction -- Sedimentation Prediction -- References -- Atchafalaya Bay Channel -- Setting -- Need for Sedimentation Predictions -- Sedimentation Prediction -- References -- Dogtooth Bend Reach, Mississippi River -- Setting -- Need for Sedimentation Prediction -- Sedimentation Prediction -- References -- Appendix C : Decision Tree Tool Selection -- Appendix D : Acronyms and Abbreviations -- Index.

Sommario/riassunto

MOP 156 describes navigation channel sedimentation, lists solutions to sedimentation problems in those channels, and recommends best practices for predicting navigation channel sedimentation responses resulting from those solutions.
