

Dredging Summit and Expo 2022

Houston, Texas, USA
25 - 29 July 2022

Editors:

Donald F. Hayes
Kendall Brome

ISBN: 978-1-7138-6011-2

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2022) by Western Dredging Association
All rights reserved.

Printed by Curran Associates, Inc. (2022)

For permission requests, please contact Western Dredging Association
at the address below.

Western Dredging Association
P.O. Box 5797
Vancouver, WA 98668-5797
USA

Phone: (360) 750-0209
Fax: (360) 750-1445

weda@comcast.net

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

PROCEEDINGS

DREDGING SUMMIT

AND EXPO 2022

July 25-29, 2022
Houston, TX

Edited by

Donald F. Hayes, Ph.D., P.E., BCEE, F. ASCE
Principal, The Dredging Professor, LLC

And

Kendall Brome
Graduate Student, Louisiana State University

Published by

Western Dredging Association
P. O. Box 1393
Bonsall, CA 92003

www.westerndredging.org

FOREWORD

The *Dredging Summit and Expo 2022* was held in Houston, TX, on July 25 to 29, 2022. The conference was organized by Mr. Thomas Cappellino, Executive Director of the Western Dredging Association (WEDA), the WEDA Technical Papers Committee, and the WEDA Events Committee. The Technical Papers Committee members were Dr. Shelly Anghera (Chair), Mr. Robert Ramsdell, Ms. Lori Brownell, Mr. Walter Dinicola, Mr. Paul Fuglevand, and Dr. Donald Hayes. Events Committee members were Mrs. Carol Shobrook (Chair), Mr. Mathew Binsfeld, and Mr. Jos Clement.

These proceedings include 70 papers and extended abstracts by a broad spectrum of professionals working in the dredging community. These papers describe successful projects and important research that dredging professionals can rely on to further advance the profession. Readers will find the context of these proceedings wide ranging, covering almost every aspect of dredging, dredged material management, beneficial use, sustainability, equipment innovations, contaminated sediment management, and environmental compliance.

These high-quality manuscripts result from hard work and dedication to excellence by the authors. Their willingness to contribute to the continuing education of dredging professionals by sharing their knowledge and expertise is deeply appreciated. The Western Dredging Association makes these proceedings publicly available as part of its educational mission. We hope they spur more dredging professionals to share their work with others, through future conference proceedings and the Journal of Dredging.

TABLE OF CONTENTS

FOREWORD	Page ii
----------------	------------

DREDGING SUMMIT & EXPO 2022 TECHNICAL PAPERS

SESSION 1A – ENGINEERING WITH NATURE	Paper Number	Page Number
U.S. Beneficial Use Framework Provides Nature-Based Solution and Natural Infrastructure Opportunities Staci Goetz, Victor Magar, Lis Nelis (Ramboll), Burton Suedel (United States Army Corp of Engineers), Luca Sittoni (Deltares)	1A-1	1
DPWH Innovative Solutions for Neglected Shorelines and Flood Mitigation for the Inland Water Channels in the Philippines Toribio Noel Ilaos, M.C. Tarroza (Department of Public Works and Highways)	1A-2	12
USCG and Navy Collaborate to Develop Multi-Purpose Habitat from Repurposed Pier Demolition Rubble and Maintenance Dredged Sand at Ballast Point, San Diego, California Kimbrie Gobbi (Wood Environment), Gilda Barboza, Erin Hale (US Coast Guard), Keith Merkel (Merkel & Associates, Inc.), Seung Suk (NAVFAC EURAFCENT)	1A-3	28
Utilization of a Natural and Nature-Based Solution for Dredged Material Management in a Navigational Dredging Project James Heeren (Dewberry), Joselyn Wall, Scott Minnich (Dewberry), Christopher Mullan (Dewberry), Scott Douglas (NJ DOT)	1A-4	31
SESSION 1B – SABINE-NECHES WATERWAY NEW WORK CHANNEL IMPROVEMENT PROJECT	Paper Number	Page Number
Overview of Criteria for Requesting Disposal of Sediment into EPA’s Ocean Management and Disposal Sites (ODMDs) Karen McCormick (USEPA Region 6)	1B-1	-
Sabine-Neches Waterway: A Case Study of a Cost Effective and Technically Defensible Sampling Strategy for a 35-Mile-Long Study Area Michelle Bourne, Cheryl Montgomery, Brooke Stevens, and Susan Bailey (USACE ERDC)	1B-2	44
Sabine-Neches Waterway: Integrating Lines-of-Evidence to Support the Ocean Disposal of New Work Channel Expansion Dredge Materials Brooke Stevens, Michelle Bourne, Cheryl Montgomery, and Susan Bailey (USACE ERDC)	1B-3	47
Sabine-Neches Waterway: Regulatory Compliance Modeling for Dredge Material Placement in a Ship Channel with Eight Ocean Placement Areas Susan Bailey, Brooke Stevens, Michelle Bourne, and Cheryl Montgomery (USACE ERDC)	1B-4	50

SESSION 1B – SABINE-NECHES WATERWAY NEW WORK CHANNEL IMPROVEMENT PROJECT (continued)	Paper Number	Page Number
---	---------------------	--------------------

Sabine-Neches Waterway: Developing Operational Guidance for the Ocean Disposal of New Work Dredged Materials Cheryl Montgomery, Michelle Bourne, Brooke Stevens, and Susan Bailey (USACE ERDC)	1B-5	53
--	------	----

SESSION 1C – HYDRAULIC DREDGING TECHNOLOGY ADVANCEMENTS	Paper Number	Page Number
--	---------------------	--------------------

The Technical Evolution of Hydraulic Dredging Robert Wetta, William Wetta (DSC Dredge)	1C-1	55
Innovative Approach to Production Monitoring and Process Control with ADM Non-Nuclear Density Meter Jan Peters (Alia Instruments BV)	1C-2	68
Large Scale, 4-Component, Settling Slurry Tests for Validation of Pipeline Friction Loss Models Robert Visintainer, George McCall (GIW Industries Inc.), Anders Sellgren (Lulea University of Technology), Vaclav Matousek (Czech Technical University)	1C-3	80
A Liquid Piston Pump Engine for Deep Dredging Baha Abulnaga (Mazdak International Inc.)	1C-4	96

SESSION 2A – SEDIMENT REMEDIATION	Paper Number	Page Number
--	---------------------	--------------------

Manistee Sediment Remediation Greg Zellmer, Eric Dievendorf, Matt Williams, Mandy Giampaolo, Nancy Gensky (Arcadis)	2A-1	111
Post-Dredging Amendment Enhanced Backfill and Reactive Capping – Case Studies John Collins (AquaBlok Ltd.)	2A-2	114
Evaluation of Activated Carbon for Environmental Remediation Applications Andrew Harris (Calgon Carbon Corporation)	2A-3	116
Lessons Learned – Design and Implementation of Sediment Remediation Projects Jason Raimondi (Geosyntec Consultants Inc.)	2A-4	119
Water Treatment Associated with Contaminated Sediment Dewatering Randy Pit, Amber Wilson (Infrastructure Alternatives)	2A-5	121

SESSION 2B – RESILIENCY AND DREDGE PROGRAM MANAGEMENT	Paper Number	Page Number
--	---------------------	--------------------

Coastal Engineering Solutions for Remote Pacific Island Communities Stuart Bettington (Royal Haskoning DHV), William Blank (Hall Contracting), Robyn Bussey (Tassal Group)	2B-1	124
--	------	-----

SESSION 2B – RESILIENCY AND DREDGE PROGRAM MANAGEMENT (continued)	Paper Number	Page Number
“Removal-to-Reuse” Approach to Design of Dredging and Sediment Processing Alternatives – Case Study (Gorge Dam, Akron, Ohio) Jtannar Wiens (Jacobs Engineering), Lauren Iacobucci, Eric Stern (Tipping Point Resources Group), William Andrae (Jacobs Engineering), Robert Miskewitz (Tipping Point Resources Group)	2B-2	139
Implementing a Resilient Structure to Protect Coastal and Historic Resources at Brunswick Town/Fort Anderson Phillip Todd (Atlantic Reefmaker), Jim McKee (Brunswick Town/Fort Anderson Site Manager), Devon Eluie (University of North Carolina Wilmington)	2B-3	142
Use of Rock Revetments to Protect an Industrial Island in Savannah, Georgia, from Natural and Man-made Forces Kwasi Badu-Tweneboah, Ramil Mijares (Geosyntec Consultants Inc.), Kenneth Cargill (KW Cargill), Jeffrey Green (Southern LNG/Kinder Morgan)	2B-4	145
Condition Assessment Tool for the Texas Gulf Intercoastal Waterway Dredge Material Placement Areas Nina Reins, Courtney Corso, Anthony Risko (Freese & Nichols Inc.); Emily Shelton, Matthew Mahoney (Texas Department of Transportation)	2B-5	157
SESSION 2C – ADVANCES IN DREDGING EQUIPMENT	Paper Number	Page Number
Emission Profile and Emission Reduction for Trailing Suction Hopper Dredges During Operation Dylan de Roode (TU Delft), Sape Miedema (TU Delft), Michael Beton (Great Lakes Dredge & Dock)	2C-1	160
A Study of Emissions and Dredging Efficiencies at Vancouver Fraser Port Authority Kristen Ewert (Moffatt and Nichol), John Kerolus (Port of Vancouver)	2C-2	173
Exploration of the Factors that Influence Bottom Roughness Created by Dredging Processes Michael Warwick, John Henriksen, Kyle Howell, Ken Quinones, Connor Tennant (Manson Construction Co)	2C-3	186
Water Injection Dredging in the US, Challenges and Solutions Joe Wagner, Robert Lewis (HDR Engineering, Inc.)	2C-4	201
Capsule Pipeline Technology for De-silting Water Reservoirs Baha Abulnaga (Mazdak International Inc.)	2C-5	217
SESSION 3A – HOUSTON SHIP CHANNEL EXPANSION (PROJECT 11) PANEL DISCUSSION	Paper Number	Page Number
Accelerating Houston Ship Channel Expansion (Project 11) L. Brownell, C. Jenkins, (Port Houston); Col. R. Blackmon (USACE Galveston District), D. Cheney (Gahagan & Bryant); N. McLellan (HDR), JJ Plunkett (Houston Pilots), H. Brown (USACE Galveston District)	3A-1	231

SESSION 3B – SEDIMENT REMEDIATION	Paper Number	Page Number
Maryland Department of Transportation Port Administration’s Innovative Reuse and Beneficial Use of Dredged Material Program Kristen Keene (Maryland Department of Transportation Port Administration), Walt Dinicola (Anchor QEA)	3B-1	246
The Port of Hueneme Deepening – A Project 20 Years in the Making Christina Birdsey (Oxnard Harbor District), Jack Malone, Steve Cappellino (Anchor QEA)	3B-2	254
Innovative Approaches for Assessing Post-Dredge Sediment Data and Residuals Management Decision Making of the Grasse River Adrienne Constant, Charles Guest, Paul LaRosa, Chris Gardner (Anchor QEA)	3B-3	270
Managing Debris for Environmental Dredging Projects Jamie Beaver, Matt Bowman, Mike Ciarlo (EA Engineering, Science, and Technology), Mike Palermo (Mike Palermo Consulting), Don Hayes (The Dredging Professor)	3B-4	279
SESSION 3C – DREDGE TECHNOLOGIES TO IMPROVE ACCURACY	Paper Number	Page Number
Bed Leveling and Drag Head Motion Tracking Through the Use of a Smart Phone’s Built-in Features Connor Tennant, John Henriksen, William Anderson, Jorge Beltran (Manson Construction)	3C-1	296
Intelligent Dredging Richard Crowe, Josh Hendon (ROHR-IDRECO Americas)	3C-2	-
Interactive Design Platform Matthys Dijkman (C-Job Naval Architects)	3C-3	308
“Building the Future of Dredging” A Geophysical Understanding of the Subsurface John Sawyer, P.B. Sawyer (Arc), Peteralv Brabers (Demco), and S. K. Patel (ArcDMC)	3C-4	311
USACE Expanded Use of Archival Dredging Data Benjamin Emery (USACE), Magdalena Asbornio (USACE ERDC), Kenneth Mitchell (USACE)	3C-5	318

SESSION 4A – HOUSTON SHIP CHANNEL – OVERCOMING DESIGN CHALLENGES ON THE FAST TRACK	Paper Number	Page Number
Constant Communication Brings a Complex Project to Fruition at an Accelerated Pace Richard Ruchhoeft (Port of Houston Authority)	4A-1	335
Project 11: Segment 1 and 2 – Widening the Houston Ship Channel and Bayport Ship Channel Ashley Judith (AECOM), Chester Hedderman, Dana Cheney (GBA), Richard Ruchhoeft (Port of Houston Authority)	4A-2	345
Segment 3 – Barbours Cut Channel Improvements Cameron Perry, David Broyles (HDR)	4A-3	358
Segment 4 – Boggy Bayou to Sims Bayou Channel Improvements – Navigation Cynthia Lowe, Daniel Heilman, Garland Pennison (HDR)	4A-4	361
Segment 4 – Boggy Bayou to Sims Bayou Channel Improvements – Beltway 8 DMPA Cynthia Lowe (HDR)	4A-5	373

SESSION 4B – DREDGING AND RESTORATION	Paper Number	Page Number
Procurement Strategy for Beneficial Reuse Construction – Restoring Former Marshes in San Francisco Bay Matt Taylor, Jack Fink, Dilip Trivedi, Sam Morrison (Moffatt Nichol)	4B-1	384
Dredging to Achieve One of The Largest Coastal Wetland Restoration Projects in The United States: The Bahia Grande Hydrologic Restoration Project Tessa Syvertsen, Derek Salazar, Anna Hnatow, Luis Maristany SantaMaria (Mott MacDonald), Joelynn Barclay, Allison Fischer (Texas General Land Office)	4B-2	386
How to Build a Perfect Marsh Shannon Haynes (Louisiana Coastal Protection and Restoration Authority), Venu Tammineni, Greg Mattson (Adaptive Management and Engineering)	4B-3	401
Creating Bird Islands in Coastal Louisiana Using Sediments Dredged from Baptiste Collette Bayou Burton Suedel, Jeff Corbino, Michael Guilfoyle, Jake Jung (USACE)	4B-4	404
Dredging to Restore the Cedar Bayou and Vinson Slough Inlet Derek Salazar, Thomas Everett, Michael Dunn, Luis Maristany, Aaron Horine (Mott MacDonald)	4B-5	406

SESSION 4C – DREDGE TECHNOLOGIES TO IMPROVE SAFETY	Paper Number	Page Number
Next Generation Marine Aggregate Dredger as Platform for Innovation and Basis for Fleet Renewal Olivier Marcus (Product Director Dredging Damen)	4C-1	420
Monitoring Dredging for Safety & Impacts on Ecosystem Aziah North (Kongsberg Maritime Canada)	4C-2	434
Essential Resource Management in Dredging Hydrographic Surveying Using USV and SV Pawel Pocwiardowski (NORBIT)	4C-3	441
Using Subsurface Utility Engineering Protocol on Coastal Louisiana Restoration Projects to Improve Dredging Safety Russ Joffrion (Louisiana Coastal Protection and Restoration Authority)	4C-4	443
Houston Ship Channel, Project 11: Underwater Pipeline and Utility Coordination Matthew McCollum (AECOM), Gabrielle Martinez (HDR), G. McMahan (Port Houston)	4C-5	446
SESSION 5A – HOUSTON SHIP CHANNEL – SESSION II: TURNING DREDGED MATERIAL INTO WILDLIFE HABITAT	Paper Number	Page Number
Commitment by Participants for Beneficial Use Leia Wilson (Port of Houston Authority), Dana Cheney (GBA)	5A-1	455
Houston Ship Channel, Project 11: Design Considerations for the Construction of Two Bird Islands Nathan Mezzano, Adam Sisson (AECOM), Chester Hedderman (GBA)	5A-2	458
Oyster Mitigation Opportunities for the Houston Ship Channel Ashley Judith, Nathan Mezzano (AECOM), Richard Ruchhoeft (Port of Houston Authority)	5A-3	471
M12 Marsh Creation in Tight Quarters Cameron Perry (HDR)	5A-4	480
SESSION 5B – TEXAS COAST RESTORATION – PANEL DISCUSSION	Paper Number	Page Number
A Texas Coast-Wide Effort to Restore Wetlands Using Dredged Material Daniel Opdyke (Anchor QEA), Todd Merendino (Ducks Unlimited), Angela Sunley (Texas General Land Office), Jane Sarosdy (Sarosdy Consulting, Inc.), Ray Newby (Anchor QEA), Carter Coleman (Ducks Unlimited), Matthew Mahoney (Texas Department of Transportation), Rick Coupe (Anchor QEA)	5B-1	483
SESSION 5C – SAFETY PANEL DISCUSSION		

SESSION 6A – ENVIRONMENTAL IMPACTS	Paper Number	Page Number
Water Quality Impacts and Bucket Dredging Operations Don Hayes (The Dredging Professor LLC); Dave James, Joshua Gonzales, Caitlyn Schreiber (University of Nevada Las Vegas), Mark Zhang (Columbia University), Ali Saber Sichani (University of Toronto)	6A-1	486
Recipient Site Selection and Environmental Coordination – Key Elements in Successful Coral Relocation, Survivorship, and Resiliency during Jetty Reconstructions in South Florida Anne Laird (Cummins Cederberg, Inc.)	6A-2	504
Satellite-based Water Quality Monitoring: Exploring the Potential for Spatial and Temporal Mapping Thomas Heege, Karin Schenk, Hendrik Bernert, Philipp Bauer, Edward Albada (EOMAP USA)	6A-3	507
Seagrass Mitigation Through Wind Wave Reduction Phillip Todd (Atlantic Reefmaker), Tyler Stanton (North Carolina Department of Transportation), Mark Fonseca, Erin Hodel (CSA Ocean Sciences, Inc.)	6A-4	510
Investigation Into Alternative Turtle Mitigation Strategies with TSHDs Kelsey Lank, Thomas “Chris” Roberts (Great Lakes Dredge & Dock)	6A-5	513
SESSION 6B – BENEFICIAL USE	Paper Number	Page Number
A PIANC EnviCom Report on the Beneficial Use of Dredged Material Burton Suedel (USACE), Victor Magar (Ramboll), Luca Sittoni (Deltares)	6B-1	527
Beneficial Use of Dredged Material Along the Texas Lower Coast Alexander Freddo (Anchor QEA), Todd Merendino (Ducks Unlimited), Harrison McNeil, Sarah Garza (Port of Corpus Christi), Ray Newby, Hayden Smith, Daniel Opdyke (Anchor QEA)	6B-2	530
Clean Sediments and Clear Channels for Howards Bay and Fraser Shipyards – Combined Navigation and Remediation Dredging Michael Erickson, Mark Graveling, Eric Dievendorf, Lisa Tomlinson, Sarah Hill, Priscilla Viana, Amanda Kohler (Arcadis)	6B-3	545
Experiences with Beneficial Use of Dredged Material in Sensitive Habitats in Coastal New Jersey, USA; Benefits to Coastal Resiliency in the Face of Climate Change Scott Douglas (NJ Department of Transportation); Michael Marano, M. Lunemann (WSP USA, Inc.), S. Flanigan (GBA), James Heeren (Dewberry)	6B-4	554
Beneficial Use of Contaminated Sediments: A Literature Review White Paper Eric Hedblom, Eric Dott (Barr Engineering); John Toll (Windward Environmental LLC), Luca Sittoni (Deltares), Claire Detering (Windward Environmental LLC), Craig Gustafson (Barr Engineering)	6B-5	570

SESSION 6C – SAMPLING TECHNOLOGY ADVANCEMENTS	Paper Number	Page Number
Why Vibracore Sediment Acquisition Monitoring is Being Considered at More Sites for Remedial Design – Ongoing Refinements to V-Sam Technology Connor Lamb, Teal Dreher, Anthony Cerruti, Amber Lutey (Dalton, Olmsted & Fuglevand, Inc.)	6C-1	575
Use of Vibracore Sediment Acquisition Monitoring in the Field – Data Collection and Processing to Optimize Sediment Dredging Design Anthony Cerruti, Connor Lamb, Teal Dreher, Amber Lutey (Dalton, Olmsted & Fuglevand, Inc.)	6C-2	584
Benefits of V-Sam in Sediment Remediation – Trends Observed from Data Collection and Implications to Future Remedial Costs Teal Dreher, Connor Lamb, Anthony Cerruti (Dalton, Olmsted & Fuglevand, Inc.)	6C-3	590
Efficient Shallow Water Real-Time Dredging Monitoring Pawel Pocwiardowski (NORMIT), Christopher Sullivan (Chesapeake Tunnel JV), Mike Mutschler (Seahorse Geomatics)	6C-4	601