**A Workshop on Beneficial Use of Dredged Materials for Resilient Tidal Marsh Restoration and Creation**

September 28, 2017

11:00am to 3:50pm

The Maritime Aquarium

Norwalk, CT

Creating and restoring marshes along shorelines has the potential to enhance both ecosystem resilience and provide green infrastructure to better protect communities from the impacts of flooding and sea level rise. Recently the use of dredged sediments for the creation and restoration of marshes was piloted in the northeast and mid-Atlantic coastal states as a resilience strategy, particularly after Superstorm Sandy impacted the region. While information on these projects is being shared locally, there remains a need to increase collaboration and share resources and project experiences across state and regional boundaries.

The UCONN Department of Marine Sciences and the Connecticut Institute for Resilience and Climate Adaptation (CIRCA) are hosting this workshop on the Beneficial Use of Dredged Materials for Resilient Tidal Marsh Restoration and Creation. The workshop will bring together case study presentations of projects from Rhode Island, New York, and New Jersey, and a feasibility study for the state of Connecticut. Project planning, design, permitting, implementation and monitoring will be discussed by representatives from fellow state and federal regulatory agencies, funding organizations, and researchers. The workshop is designed to provide opportunities to network with fellow managers while sharing lessons learned, and to build future collaborations.

The three major goals of the workshop are:

1. Framing of cross-regional collaboration of Mid-Atlantic/New England Regions, including a comparison across federal regions
2. Identification of resources with an emphasis on networking and information sharing
3. Providing models for resilient and sustainable restored and created wetlands using dredged sediments to address barriers for implementation of projects

Acknowledgments: We would like to thank the planning committee for their time and effort to make this workshop a success. The planning committee members are:

Peter Francis – CTDEEP Coastal Resources Section of Land & Water Resource Division

Robin Murray – NJDEP Office of Coastal and Land Use Planning Coastal Zone Management

Steve Jacobus – NJDEP Office of Coastal and Land Use Planning Coastal Zone Management

Elizabeth Semple – NJDEP Office of Coastal and Land Use Planning Coastal Zone Management

Lesley Patrick – Science and Resilience Institute at Jamaica Bay

Jessica Fain – Science and Resilience Institute at Jamaica Bay

Dave Hudson – The Maritime Aquarium

Thomas Naiman – The Maritime Aquarium

Jennifer O’Donnell – UConn Department of Marine Sciences

Rebecca French – UConn Connecticut Institute for Resilience and Climate Adaptation

Kimberly Bradley – UConn Connecticut Institute for Resilience and Climate Adaptation

Colleen Dollard – UConn Connecticut Institute for Resilience and Climate Adaptation

This workshop is made possible by a grant from the Connecticut Department of Housing Sandy Recovery Program to the Department of Marine Sciences and the Connecticut Institute for Resilience and Climate Adaptation (CIRCA) at the University of Connecticut. We would also like to thank the Maritime Aquarium at Norwalk for the generous donated use of their facilities for this event.

**Agenda**

**10:30 – 11:00 AM** Participant Registration

**11:00 – 11:15 AM** Welcome and Workshop Overview

*Speakers: Brian Thompson, CT DEEP and Rebecca French, UCONN CIRCA*

**11:15 – 11:45 PM** Case Study: Ninigret Rhode Island

*Speaker: Caitlin Chaffee, RI CRMC*

**11:45 – 12:15 PM** Case Study: New Jersey Projects

*Speaker: Metthea Yepsen, NJDEP*

**12:15 – 12:30 PM** Facilitated Discussion of Case Study Findings

 *Facilitator: Peter Francis, CT DEEP*

**12:30 – 1:30 PM Working Lunch – *Tables of Interest***

**1:30 – 2:15 PM** Panel Discussion:Project Partners Panel

*Panelists: Larry Oliver, USACE – NE District; Sacha Spector, Doris Duke Charitable Foundation; Walker Golder, National Audubon Society; and Jim Turek, NOAA*

**2:15 – 2:45 PM** Case Study: Jamaica Bay, New York

 *Speakers: Lisa Baron and Peter Weppler, USACE - NY District*

**2:45 – 2:55 PM Break**

**2:55 – 3:25 PM** Connecticut: Status of the Feasibility Assessment

*Speaker: Jennifer O’Donnell, UCONN Dept. of Marine Sciences*

**3:25 – 3:35 PM** Facilitated Discussion of Case Study Findings

 *Facilitator: Peter Francis, CT DEEP*

**3:35 – 3:50 PM** The Way Forward

*Facilitator: Carolyn Lin, UCONN Dept. of Communications*

\*Note the Metro-North westbound train leaves at 4:13 PM and the eastbound leaves at 4:35 PM.

Workshop sponsored by the Department of Marine Sciences and the Connecticut Institute for Resilience and Climate Adaptation at the University of Connecticut with funding from the Connecticut Department of Housing Sandy Recovery Program.

***Tables of Interest* - Lunch Table Topics**

The workshop will include a working lunch, where you will be asked to participate in an active discussion with the members of your table. Please review the lunch table topics below, and be prepared to select a seat at the table labeled with your topic of interest when you arrive. Seating will be first come - first serve, therefore, select several preferred topics.

1. **Marsh Creation/Restoration for Community Resilience:** **(Facilitator: Dave Hudson)** A focused discussion on the green infrastructure and living shorelines strategies and flood and erosion control benefits associated with beneficial use of dredge material for wetland restoration, as compared to habitat restoration and ecological services as a way to enhance community resilience. Community resilience includes both resilient infrastructure and housing as well as enhanced quality of life and health for residents.
2. **Resource Conflict/Conversion/Trade-offs (a.k.a. Habitat Tradeoffs): (Facilitator: Harry Yamalis)** Decision conflicts from a resource management perspective concerning conversion of coastal habitat and effects of managed species including fisheries resources, shellfish, and protected species and habitats.
3. **Design Standards Integrating Sea Level Rise: (Facilitator: Rebecca French)** Addressing sea level rise during the planning and implementation phases of projects by defining design standards; experiences and recommended approaches**.**
4. **Design Parameters: (Facilitator: Jennifer O’Donnell)** Experiences with developing and defining design parameters for wetland restoration/creation projects utilizing dredge materials, and thin layer deposition approaches.
5. **Monitoring: (Facilitator: Metthea Yepsen)** The success of beneficial use of dredge materials for resilient wetland restoration/creation must be evaluated through monitoring and data analysis. What are the highest priority parameters that should be identified in a monitoring plan, and how is monitoring funded?
6. **Successful Project Table: What defines Success? (Facilitator: Katie Lund)** Establishing project objectives and goals is an important component of project development particularly in working to secure funding and permits. Shared experiences on just what defines a successful project?
7. **Regulatory Themes: (Facilitator: Peter Francis)** A focused discussion of the regulatory challenges, strategies and potential barriers associated with the beneficial use of dredge material for wetland creation/restoration.
8. **Funding: Linking Resilience to Economic Development: (Facilitator: Jessica Fain)** How can the link between resilience and economic development be defined in a way that encourages innovative funding strategies for the beneficial use of dredge material for wetland restoration/creation?
9. **Dredge or Restoration: The Chicken or the Egg**: **(Facilitator: Steven Jacobus)** The sequence of identifying project goals and objectives, whether from a dredge management or wetland restoration/creation standpoint, can affect the regulatory and permitting requirements, and funding options. What are the benefits and drawbacks to identifying wetland restoration/creation opportunities prior to sources of suitable dredge materials, or vice versa?
10. **Community and Stakeholder Engagement: (Facilitator: Carolyn Lin)** Discussion of strategies to bring key stakeholder groups and the public to the table to participate in project development and implementation.

**Speaker Bios**

**(listed in alphabetical order)**

**Caitlin Chaffee**

**Policy Analyst**

**Rhode Island Coastal Resources Management Council**

Caitlin Chaffee is a policy analyst with the Rhode Island Coastal Resources Management Council, where she focuses on coastal habitat restoration, climate change adaptation and stormwater management. She develops technical guidance and policy related to these areas, manages the RI Coastal and Estuarine Habitat Restoration Trust Fund and technical advisory committee, and oversees management of multiple federal restoration grants and projects, working extensively with state, federal, local, non-profit and private sector partner organizations. Caitlin earned her Master of Environmental Science and Management in Wetland, Watershed and Ecosystem Science at the University of Rhode Island, and holds a Bachelor of Science in Biology from St. Michael’s College.

**Lisa Baron**

**Project Manager**

**United States Army Corp of Engineers – New York District**

Lisa Baron is a Project Manager with the U.S. Army Corps of Engineers-NY District, Civil Works Branch.  She has more than 25 years of experience, including ecosystem restoration initiatives, dredged material management, environmental dredging, remedial investigations and ecological risk assessment.  Lisa manages the New York District’s large-scale restoration program for the NY/NJ Harbor Estuary (25 mile radius around the Statue of Liberty) and 124 miles of the Hudson River.  Lisa has served as the Restoration Work Group Chair of the NY/NJ Harbor Estuary Program since 2010, coordinating restoration throughout the region with federal, state, local partners and NGOs.  Lisa served as Chief of the Harbor Programs Branch (2011) responsible for the execution of the ecosystem restoration and deepening program for the NY/NJ Harbor.  Prior to joining the NY District, Lisa was a Project Manager with NJDOT’s Office of Maritime Resources and the Division of Environmental Resources. She also worked in private consulting and for the U.S. DOE Oak Ridge National Laboratory. Lisa earned an MS degree in Biology from Indiana University of Pennsylvania and a BS in Biology/Marine Biology from Bloomsburg University.

**Peter B. Francis**

**Supervising Environmental Analyst**

**Coastal Resources Section of the Land & Water Resources Division**

**Connecticut Department of Energy and Environmental Protection**

Peter Francis has worked in the regulatory and technical fields of coastal zone management for over twenty years.  Peter began his coastal management career in 1995 as an environmental analyst in the coastal permitting and enforcement section of the Office of Long Island Sound Programs (OLISP), a division of Connecticut’s Department of Energy and Environmental Protection.  After six years of progressive responsibility, he was promoted to supervisor in 2001 where he was responsible for the oversight and administration of the coastal regulatory program.  After a decade of regulatory section supervision, Peter began leading the Coastal Resources Section in the Land & Water Resources Division where he is currently responsible for supervising DEEP’s technical programs including GIS, remote sensing, dredging, habitat restoration, living shorelines, and coastal resilience initiatives.  This role also requires the supervision of the coastal grants program. Prior to joining CT DEEP, Peter worked as a NOAA Fisheries Observer on domestic fishing vessels in the Bering Sea and also completed research/internships with DEEP’s Fisheries Division, NOAA’s National Marine Fisheries Service, and Mystic Marinelife Aquarium.  He holds a bachelor’s degree in Environmental Studies from Connecticut College with additional fisheries training at the University of Alaska – Anchorage and executive management studies at the University of Connecticut.

**Rebecca French**

**Director of Community Engagement**

**University of Connecticut – Connecticut Institute for Resilience and Climate Adaptation**

As the CIRCA Director of Community Engagement, Rebecca French translates science and engineering to help communities, state and local government, private industry, and academic partners implement solutions to adapt to a changing climate and extreme weather while strengthening resilience through economic development, policies and social cohesion. Rebecca serves on the Connecticut Long Term Recovery Committee and the State Agencies Fostering Resilience Council. She is the lead project investigator for Connecticut on a NOAA Coastal Resilience Grant to advance the use of living shorelines in the northeast in partnership with the Northeast Regional Ocean Council. She will be directing the Connecticut regional resilience plan funded by the HUD National Disaster Resilience program at the Dept. of Housing. Previously she worked in the US EPA and in the Office of Senator Sanders (I-VT) on environmental policy as a AAAS Science & Technology Policy Fellow. Rebecca holds a Ph.D. in Geosciences from Virginia Tech, an M.S. in Soil Science from Cornell University and a B.A. from Oberlin College in Chemistry and Environmental Studies.

**Walker Golder**

**Director**

**Atlantic Flyway Coast Strategy**

**National Audubon Society**

Walker Golder is the Director of the National Audubon Society’s Atlantic Flyway Coast Strategy. Walker has work to advance conservation of coastal areas since 1989, beginning with Audubon’s newly developed NC Coastal Sanctuary System, a system that he built to include 21 coastal sanctuaries that protect North Carolina’s waterbirds and shorebirds, and later as Deputy Director of Audubon’s North Carolina state program.  Today, he is engaged flyway-scale conservation strategies focused estuaries, beaches and islands, and the marine environment along the Atlantic coast. He has worked closely with diverse partnerships to develop new techniques for the beneficial use of dredged material to restore and enhance habitats for coastal bird populations. Walker holds an M.S. in Marine Biology and a B.S. in Biology from the University of North Carolina at Wilmington.

**Carolyn A. Lin**

**Professor**

**University of Connecticut – Department of Communication**

Carolyn Lin received her B.A. in Foreign Languages and Literature from National Central University in Taiwan, M.S. in Journalism and Mass Communication from Iowa State University and Ph.D. in Mass Media and Telecommunication (currently Media and Information) from Michigan State University. Her research and teaching focus on the content, uses and effects of digital, media, risk, crisis, marketing, and cross-cultural communication on individuals, communities and society. She was Head of Communication and Associate Dean of the Graduate School at the University of Connecticut. Her recent research covers such topics as environmental risk communication, healthy eating/active living, digital marketing, social media advertising, and multicultural marketing communication.  She has also developed and conducted research on the uses and effects of a bioinformatics system as well as two separate mobile applications for obesity prevention and storm preparedness. Other recent risk communication projects encompass such areas as HIV prevention, nutrition education, medication adherence, binge-drinking avoidance, smart partying norms and influenza immunization, among others. Her interests in climate-change related risk and crisis communication include coastal, structural and social resiliency as well as environmental literacy, health and sustainability. She is an Affiliated Faculty Member of the Connecticut Institute for Resilience and Climate Adaptation (CIRCA).

**Jennifer O’Donnell**

**Associate Research Professor**

**University of Connecticut – Department of Marine Sciences**

Jennifer O’Donnell is an Associate Research Professor in the Department of Marine Sciences, University of Connecticut and an Affiliated Faculty Member of the Connecticut Institute for Resilience and Climate Adaptation (CIRCA). She is also a Principal Engineer with Coastal Ocean Analytics, a coastal engineering and applied science firm focused on coastal, estuarine and ocean environments. As a coastal engineer, her work is focused on understanding the potential and application of living shoreline and green infrastructure approaches for shoreline protection to increase coastal resiliency and to protect and enhance coastal habitats. Her projects emphasize a multi-disciplinary approach to addressing shoreline change concerns and the design and implementation of sustainable coastal solutions. She has a Ph.D. in Engineering from Cambridge University, a Master of Civil Engineering in Coastal Engineering from the University of Delaware and a BSE in Civil Engineering from Duke University.

**Larry Oliver**

**Chief, Evaluation Branch**

**New England District U.S. Army Corps of Engineers**

Larry Oliver has over 30 years of experience in environmental resources management and ecosystem restoration.  He is currently the chief of the New England District’s Evaluation Branch, which provides environmental and economic analysis and compliance for Corps of Engineers projects and supports projects within the navigation (dredging and dredged material management), flood risk management, and ecosystem restoration missions. From 2002 to 2014, Mr. Oliver was the chief of the District’s Ecosystem Restoration Project Section leading a team in executing the district’s ecosystem restoration programs, with projects to restore salt marshes and other estuarine habitats, freshwater wetlands, rivers and fish passage.  Over the past 30 years, Mr. Oliver has served as project manager or biologist on numerous projects throughout New England. He has a Master of Science in Environmental Studies from the University of Massachusetts – Lowell and a Bachelor of Science in Natural Resources from the University of Rhode Island.

**Sacha Spector**

**Program Director for the Environment**

**Doris Duke Charitable Foundation Environment Program**

Dr. Sacha Spector is the program director for the environment at the Doris Duke Charitable Foundation, where he oversees all environmental conservation grant-making of the foundation. He brings to the role a track record of conservation research and practice spanning 25 years and four continents. Previously, Spector was director of conservation science at Scenic Hudson, leading the group’s efforts on climate change, land conservation planning and natural resource stewardship. There, he developed sea level rise and climate change adaptation initiatives in close cooperation with communities and state agencies while prioritizing land acquisitions and ecological restoration projects focused on the region’s most biologically important sites. Spector also managed the invertebrate conservation program at the Center for Biodiversity and Conservation at the American Museum of Natural History and was the Red List Authority for the IUCN Species Survival Commission. Spector maintains positions as an adjunct associate professor at Columbia University’s Department of Ecology, Evolution and Environmental Biology and as a visiting scientist at the American Museum of Natural History. He has earned recognition for his conservation expertise through awards and grants from the Environmental Protection Agency, NASA, National Science Foundation, Wildlife Conservation Society and Zoological Society of London. Spector has also authored and/or co-authored more than 30 research papers, books and articles. He earned his Doctor of Philosophy degree in ecology from the University of Connecticut and his Bachelor of Science degree in environmental biology from Yale University.

**Brian P. Thompson**

**Director**

**Land and Water Resources Division**

**Bureau of Water Protection and Land Reuse**

**Connecticut Department of Energy and Environmental Protection**

Brian Thompson is Director of the Land & Water Resources Division in the Connecticut Department of Energy & Environmental Protection (DEEP). The Land & Water Resources Division’s mission is to restore, protect and conserve Connecticut’s inland waters and coastal resources. Mr. Thompson oversees implementation of Connecticut’s federally-approved coastal zone management program, through which DEEP regulates work in tidal, coastal and navigable waters and tidal wetlands; restores coastal habitat; improves public access; protects water-dependent uses, public trust waters and submerged lands; promotes harbor management; and facilitates research. Before joining DEEP in 2006, Mr. Thompson worked in various environmental management capacities in the private sector and the federal government. Mr. Thompson holds a Bachelor’s Degree in Geology from St. Lawrence University and a Master’s Degree in Marine Affairs from the University of Rhode Island.

**James Turek**

**Restoration Ecologist**

**National Oceanic and Atmospheric Administration – Restoration Center**

Mr. Turek is a restoration ecologist with over 30 years of experience in fishery biology and aquatic ecology. He has worked with the NOAA Fisheries Restoration Center for the past 18 years and prior to this period, worked for 13 years as an environmental scientist at consulting firms in Maryland and Rhode Island. He also worked with NOAA Fisheries Habitat Division in the Chesapeake Bay region for 3 years prior to his environmental consulting experiences.  Mr. Turek is involved in the assessment and design of salt marsh and non-tidal wetland restoration projects, for proactive restoration and resiliency, as well as for compensatory projects in NRDA cases.  His expertise also includes expertise with diadromous fish passage including the assessment, design and implementation of dam removals, nature-like fishways and structural fishways. He is responsible for managing or providing technical assistance on an array of coastal habitat and migratory passage restoration projects in Narragansett Bay, Long Island Sound, Buzzards Bay and contributing watersheds. Mr. Turek received a bachelor’s degree in Zoology and minor in Geological Sciences from the University of Maine at Orono, and a Master’s degree in Marine Affairs from the University of Rhode Island.

**Peter Weppler**

**Chief, Environmental Branch**

**Planning Division - U.S. Army Corps of Engineers, New York District**

Peter Weppler is the Chief of the Environmental Analysis Branch within the US Army Corps of Engineers-NY District’s Planning Division.  As the Branch Chief, Peter is the Senior Subject Matter Expert on Civil Works environmental policy and compliance and is responsible for providing guidance to the project teams working on flood and coastal storm risk management and ecosystem restoration studies and projects.  Among his many projects, Peter was the New York District Environmental Team Lead for the New York District’s Coastal Storm Risk Management Mission, which addresses post-Sandy coastal resiliency and coastal storm risk management per Public Law 113-2 – The Disaster Relief Appropriations Act.  Peter was also responsible for multiple ecosystem restoration projects, including the Jamaica Bay Marsh Islands Restoration and Hudson-Raritan Estuary Ecosystem Restoration Study, which developed the Comprehensive Restoration Plan (CRP) for the NY/NJ Harbor.  He has over 25 years of experience in the field of ecosystem restoration and flood and coastal storm damage risk management. Peter has an extensive background in ecological investigations in coastal and riverine systems throughout the New York/New Jersey Bight.

**Metthea Yepsen**

**Research Scientist**

**New Jersey Department of Environmental Protection, Division of Science, Research and Environmental Health**

Metthea Yepsen is a Coastal Research Scientist for the Division of Science Research and Environmental Health at the New Jersey Department of Environmental Protection. She specializes in wetland ecology, ecological restoration and monitoring.  She is a core team member on planning, executing, and evaluating three NJDEP beneficial use of dredged material to enhance salt marsh projects in New Jersey and is leading a team of scientists and restoration practitioners to write a framework on how to develop a monitoring plan for coastal restoration projects in New Jersey. Prior to working in New Jersey, Metthea worked on the USDA’s assessment of their wetland restoration programs and helped to develop standardized monitoring plans for environmental restoration projects in the Gulf of Mexico. She has a bachelor’s degree from the University of Pennsylvania and a Master’s Degree from the University of Maryland, College Park.