Thin Layer Placement of Dredged Material – A Web-Based Repository of Resources and Case Studies

Damarys Acevedo-Mackey, PE

Trudy J. Estes, Ph.D., PE

Environmental Laboratory

31 August 2015 at 1:00PM CDT

Khadijah Coakley

Wild Fyre Group

Outline

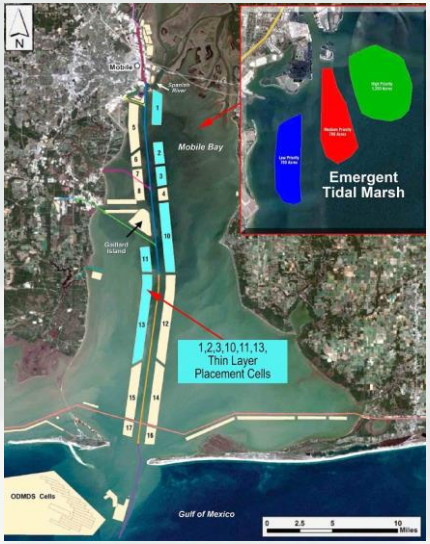
- Definition
- Project Need
- Project Objectives
- TLP Website
- TLP GIS-based Map Portal
- Case Studies Demo
- Future Actions

Definition of Thin Layer Placement

- Purposeful placement of dredged material for functional/ecological benefit
- Depends on Project Objectives
  - Placement depth not restrictively defined
  - Wetlands nourishment ~ 6 inches thick
  - Mobile Bay sediment budgeting – 6 to 12 inches
  - IJburg island creation > 12 inches

Photo from Steve Miller Ellicott Dredges LLC

Ijburg – Island Creation (de Leeuw et al. 2002)



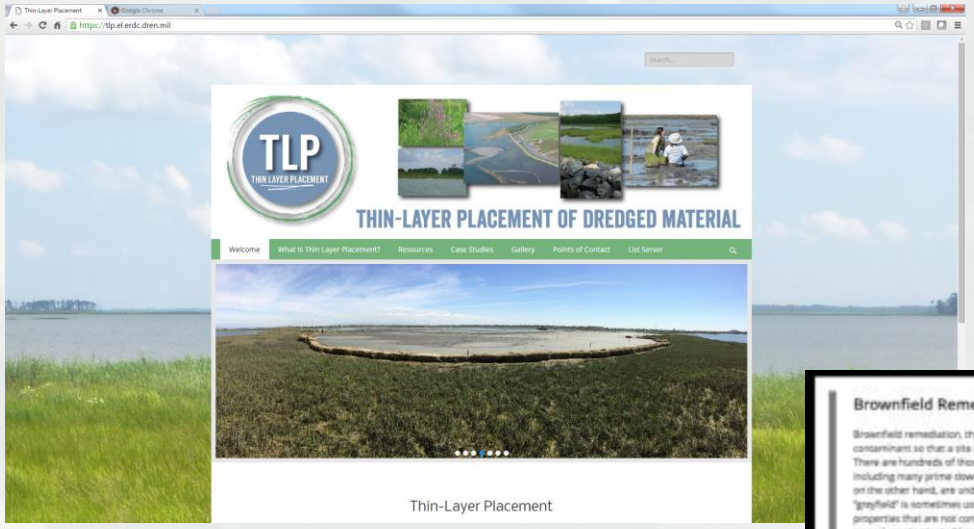
Mobile Bay

TLP Website and Database - Project Need

- Information and case studies for TLP not well documented
- Little or no technical guidance available for TLP design or implementation
- Multiple knowledge gaps
- An accessible, consolidated, living information resource is needed

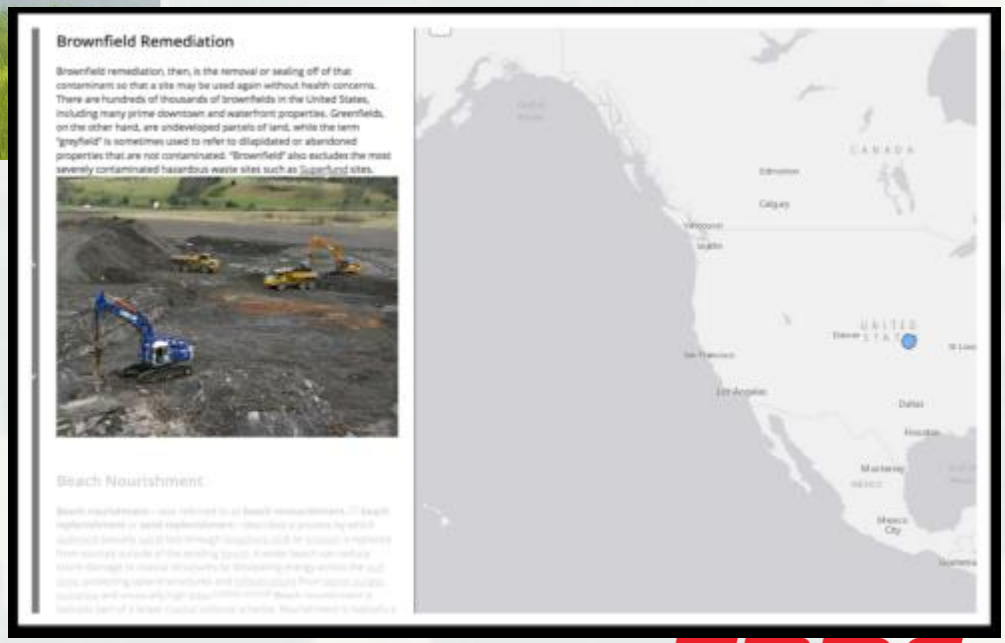
Photo from Steve Miller Ellicott Dredges LLC

TLP Tools



Website

Map Portal



Website and Database Primary Objectives

- Aggregate the current state of knowledge regarding thin layer placement of dredged material
- Consolidate literature/references pertaining to all project phases – from design to post-construction monitoring
- Provide centralized, accessible, and consolidated resource for case studies
- Provide a basis for guidance development

Website and Database Secondary Objectives

- Provide a vehicle for collection of case studies worldwide
- Create an engaging and user friendly product
- Create a database that was compatible with the USACE data integration initiative

Photo from Kirk Gilligan, Seal Beach NWR Manager

TLP Website - Access

https://tlp.el.erdc.dren.mil/

www.engineeringwithnature.org/

TLP Map Portal

Key Features of the Redesign:

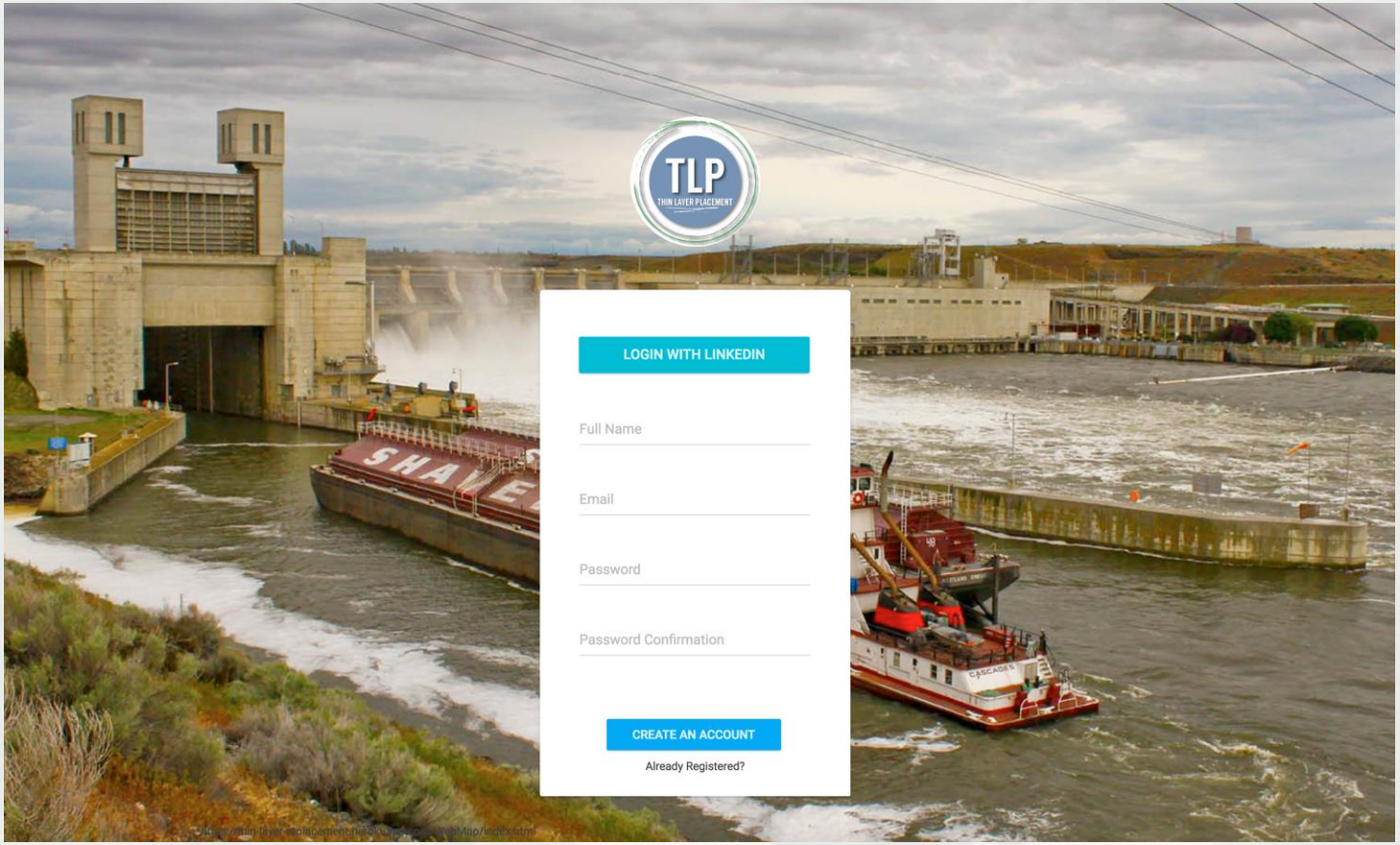
- **User-centered Design – intuitive and easy-to-use**
  - A more intuitive, easy-to-use interface
- **Login Options: LinkedIn Credentials or Email Log-in**
  - Login using email and password
  - Broader Access for Corps and non-Corps users
  - Connect your LinkedIn account to pull-in your professional profile
- **A Community of TLP Professionals**
  - Create a user profile and populate your professional information using LinkedIn or the user profile dashboard

TLP Map Portal

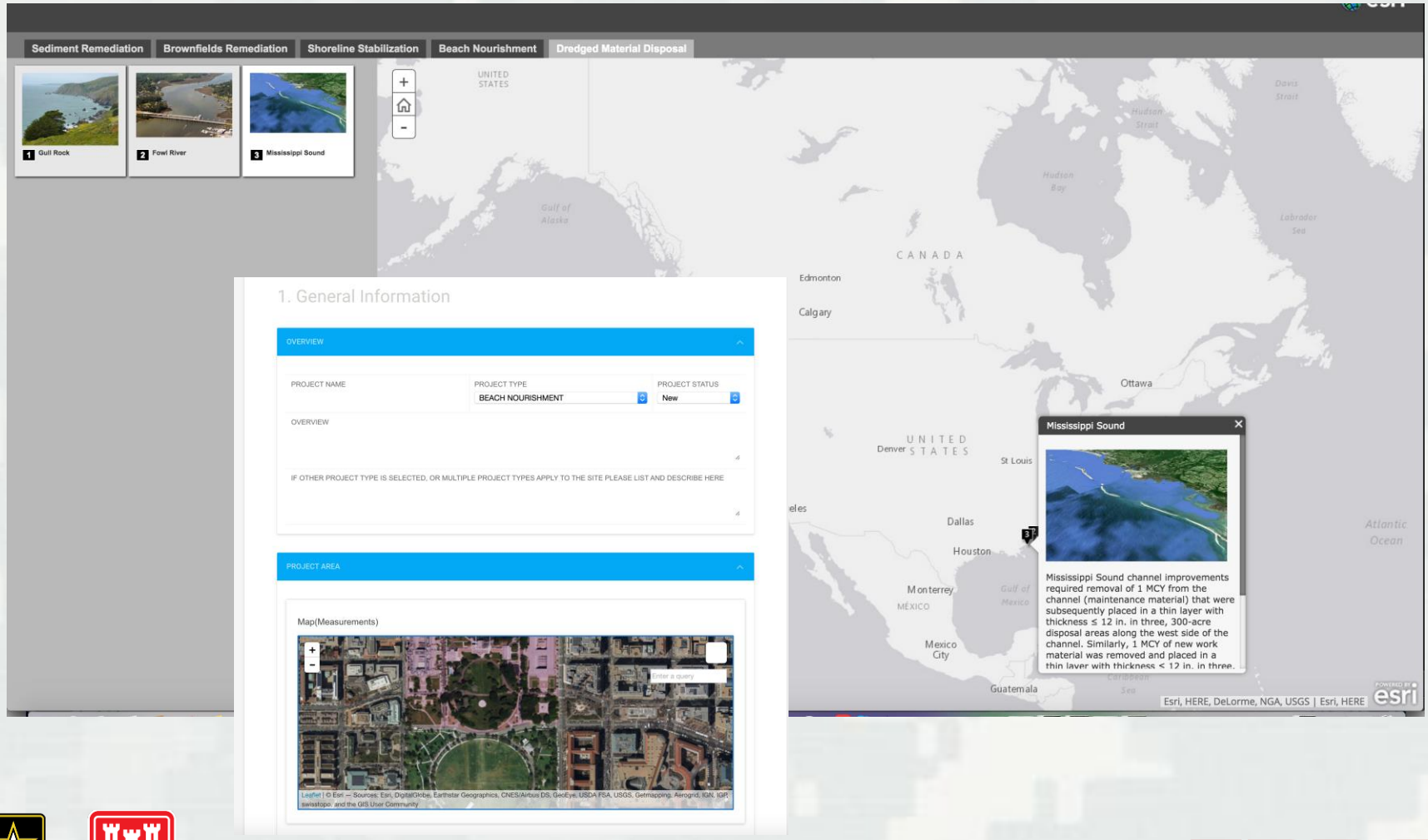
Key Functionality:

- **Draw Polygons: Unlimited Points vs. Setting a point**
  - Easily draw your project area by plotting unlimited points. All geo-location information is captured including dimensions and longitude/latitude, etc.
- **Story Maps: Upload Rich Media and Documents**
  - Easily add and remove photos, video links, reports, and other documents from your case study project information area
- **Import/Export Data: Easily Upload & Access**
  - The **Application Programming Interface** (**API**): Easily share data for any TLP case study (or all) with approved web applications. Pull raw data for any case study via our online API web service

TLP Map Portal



TLP Map Portal



U.S.ARMY

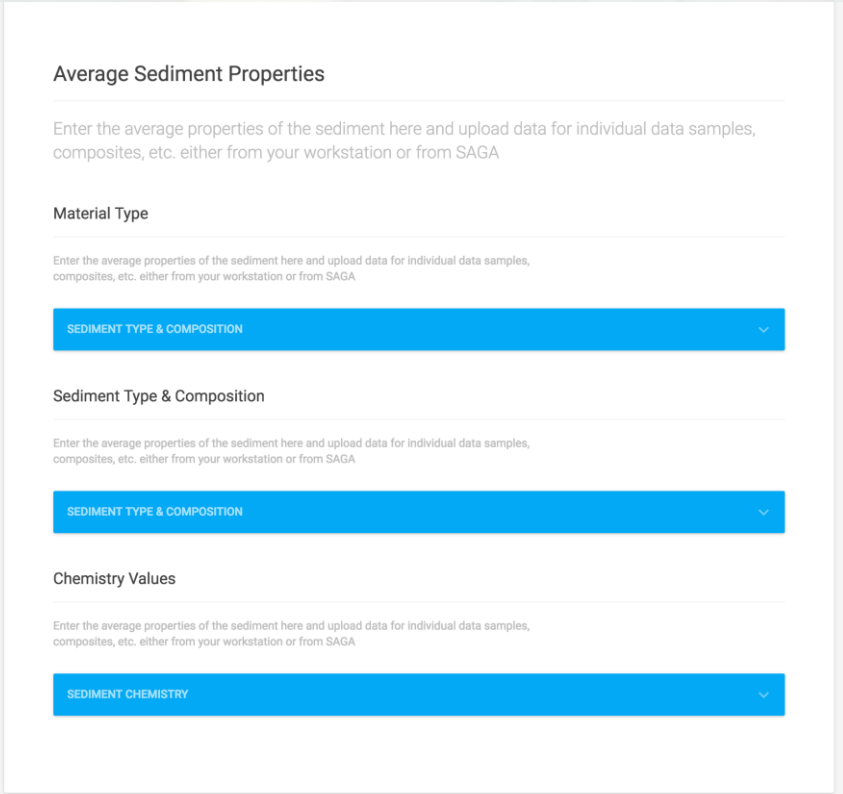
ERDC

What case study data is being captured?

Sections

- General Information
- Project Cost
- Containment Structures
- Pre-construction
- Design & Planning
- Construction
- Post-construction
- Monitoring
- Regulatory Aspects
- Lessons Learned

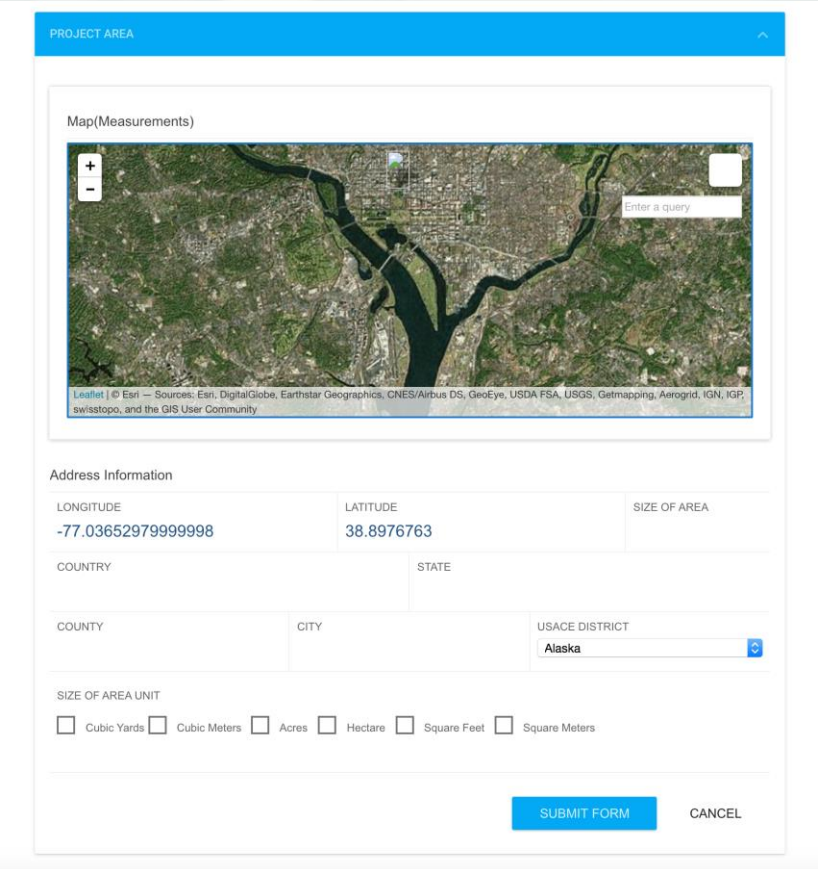
New! Upload projects using Excel



How do I create a new case study?

Easy and User-friendly:

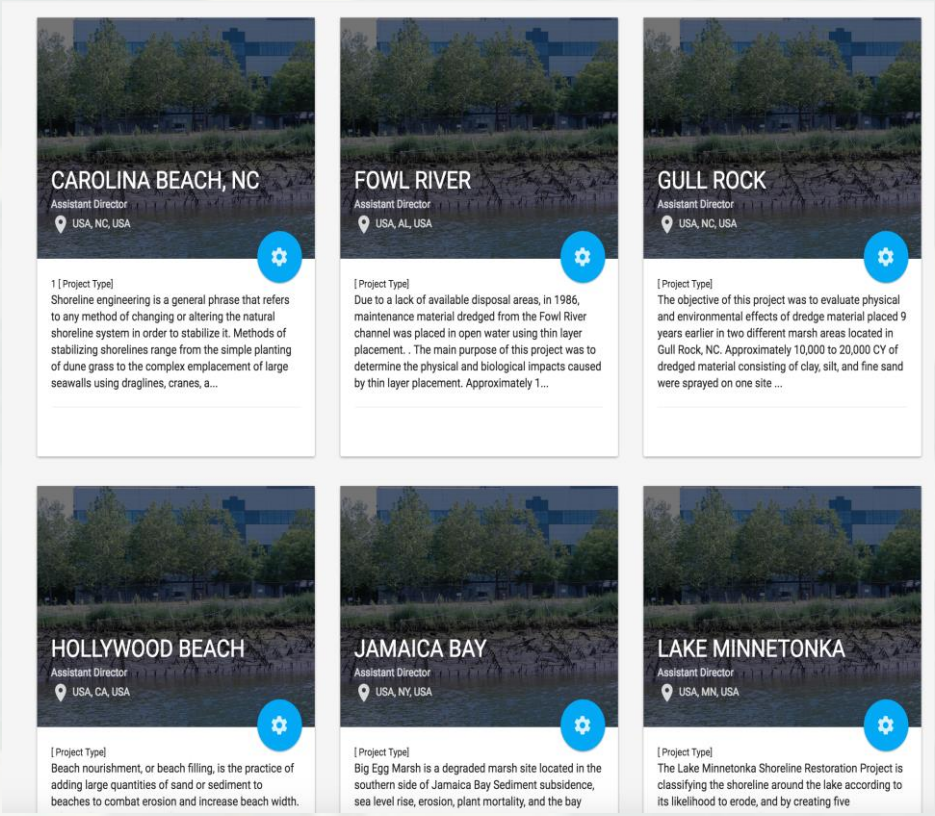
1. Create an Account
2. Create a New Case Study
3. Assign Contributors
4. Begin Inputting Information
5. Await Publishing Approval



What else can I do on the TLP website?

Join our Community!

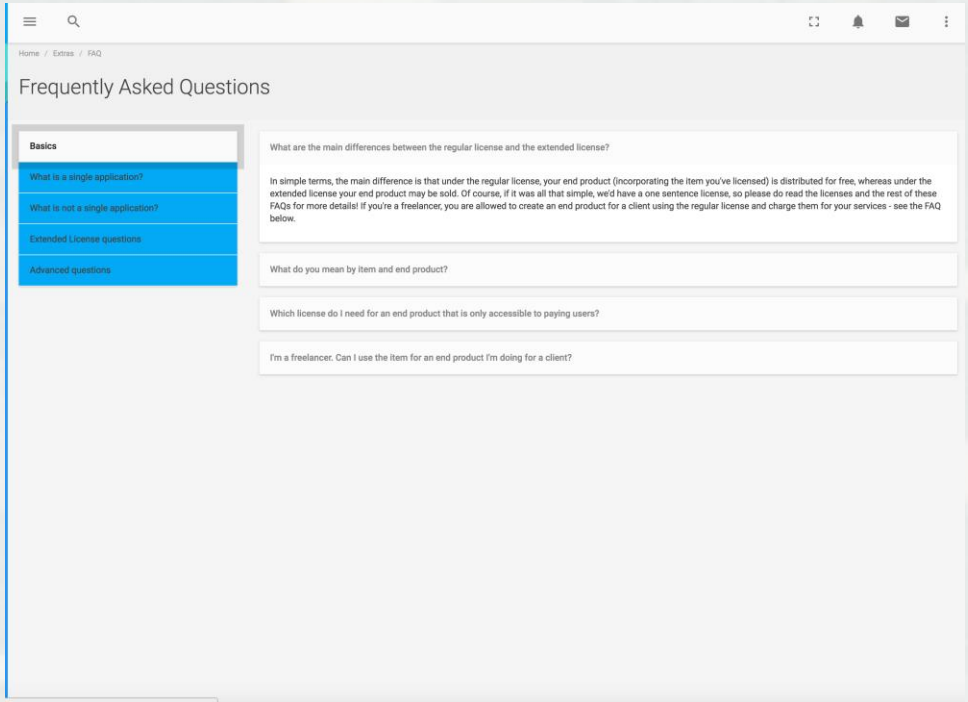
1. **Improved:** Interactive Map
2. **New:** Create User Profile
3. **New:** Case Study Directory
4. **New:** Case Study Profile Page
5. **Coming:** TLP Media Library



FAQs: How do I get help if I need it?

Fast Answers!

1. Site-wide Guidance Text
2. Form Tool Tips
3. Online FAQ Section



Future products and enhancements

- Website forum
- TLP Newsletter
- Enhanced search tool
- Enhanced case study page
- New case studies, resources, and photos will
- be added every quarter
- Formalized guidance for the practice of thin layer placement

How can I contribute?

- Case studies, models, construction methods and other relevant information that may be useful to practitioners are solicited.
- Sign up on our **List Server** and **Map Portal**

  https://tlp.el.erdc.dren.mil/list-server-and-map-portal/

Please contact us!

- **Website registration and contributions**
  - Damarys Acevedo-Mackey, PE

  damarys.acevedo-mackey@usace.army.mil
- **DOTS program manager**
  - Cynthia J. Banks

  cynthia.j.banks@usace.army.mil
- **RSM program manager**
  - Linda S. Lillycrop

  linda.s.lillycrop@usace.army.mil
- **EWN program manager**
  - Todd S. Bridges, PhD

  todd.s.bridges@usace.army.mil
- **EMRRP program manager**
  - Trudy J. Estes, PE, PhD

  trudy.j.estes@usace.army.mil

Questions?

Photo from Kirk Gilligan, Seal Beach NWR Manager

Reference Slides

TLP Website

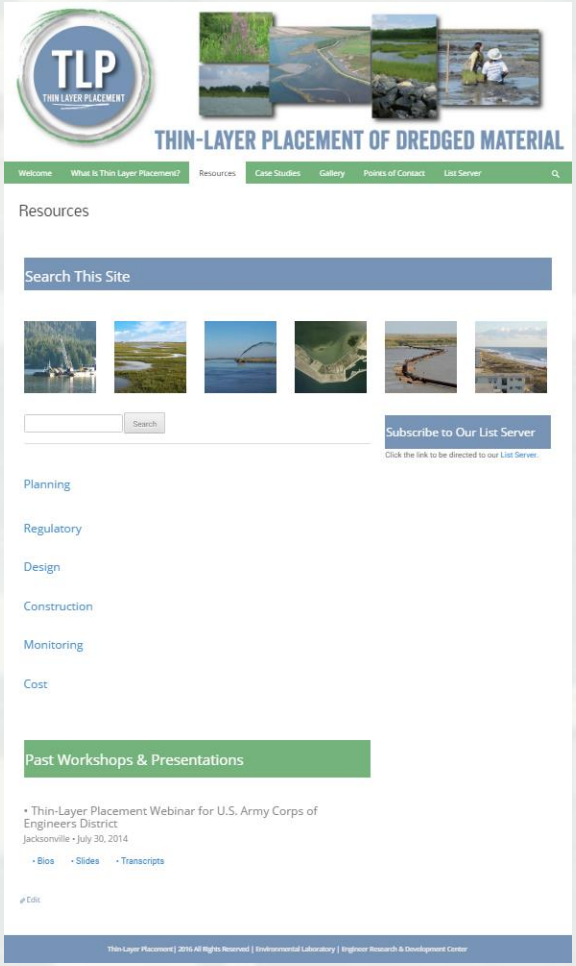
https://tlp.el.erdc.dren.mil/

Current features:

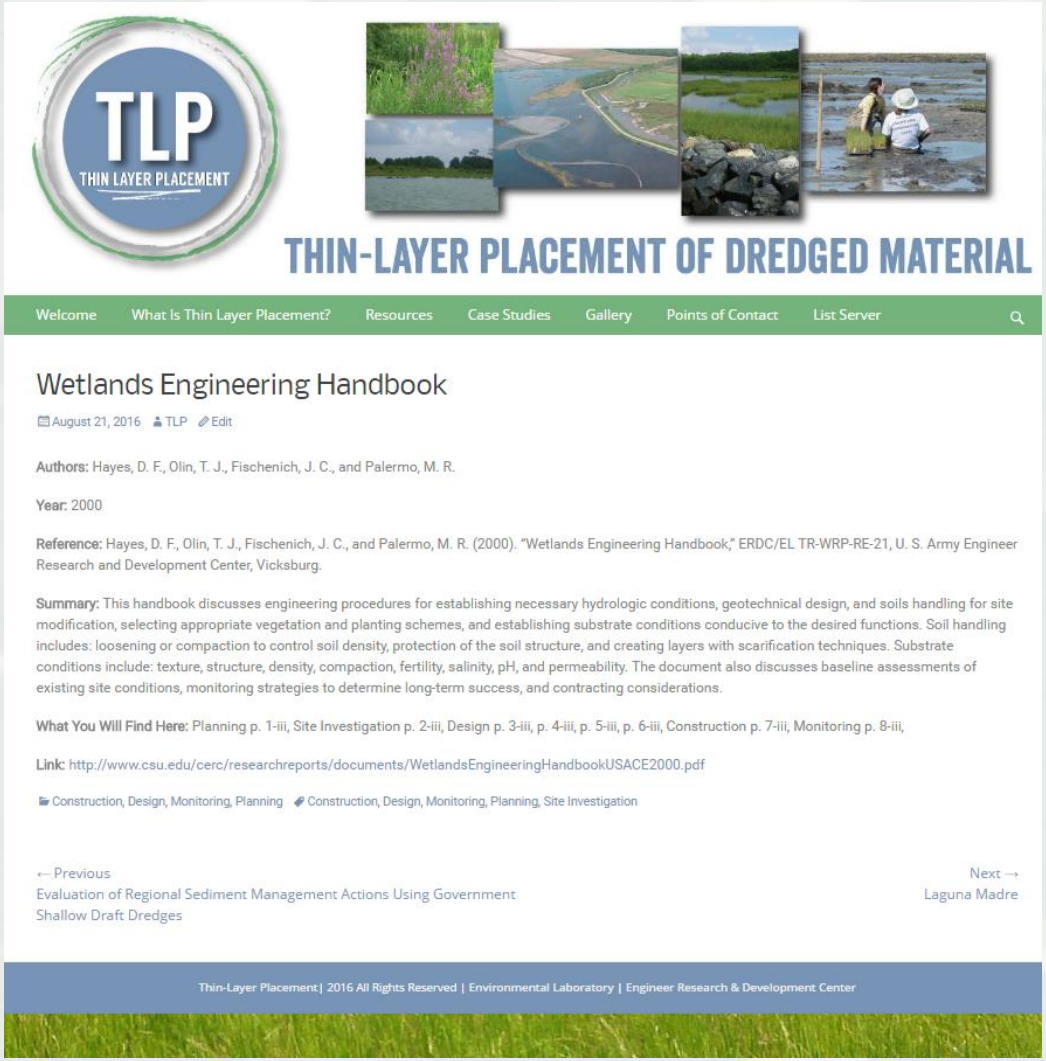
- Relevant literature
- Case studies – fact sheets, photo galleries, map-based database and project documentation/data
- Event tracker
- List server
- Contributor portal

TLP Website - Resources

- ~200 resources
- Search by relevance
- Resources summaries
  - How does it apply?
  - What you will find here?
- Quick category searches
  - Organized by project stage
- Workshops and presentations

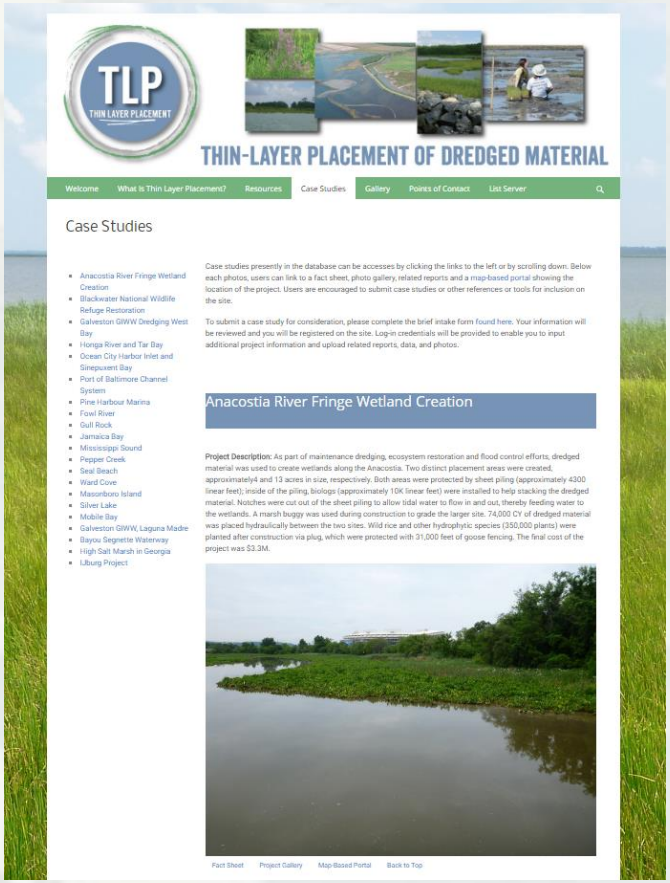


TLP Website - Resources



TLP Website – Case Studies

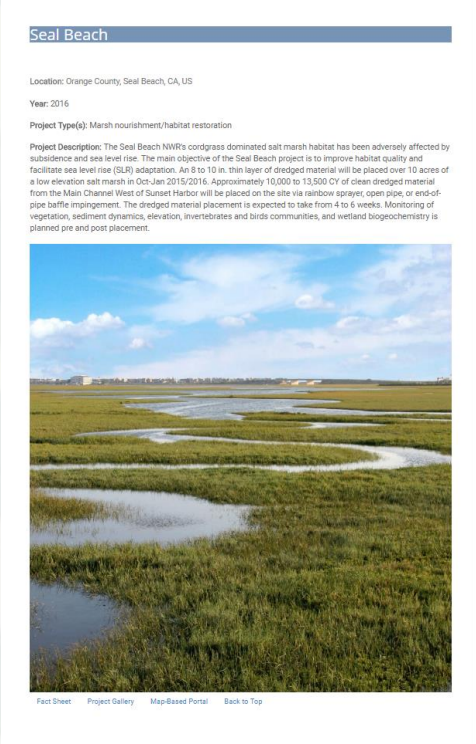
- ~21 case studies
- Factsheets
  - Background
  - Project Description
  - Findings
  - References
  - Agency/company logo and authorship
- Project Gallery



More extensive info available in Map-Based Portal…!

TLP Website – Case Studies

Project Summary



Seal Beach

Location: Orange County, Seal Beach, CA, US

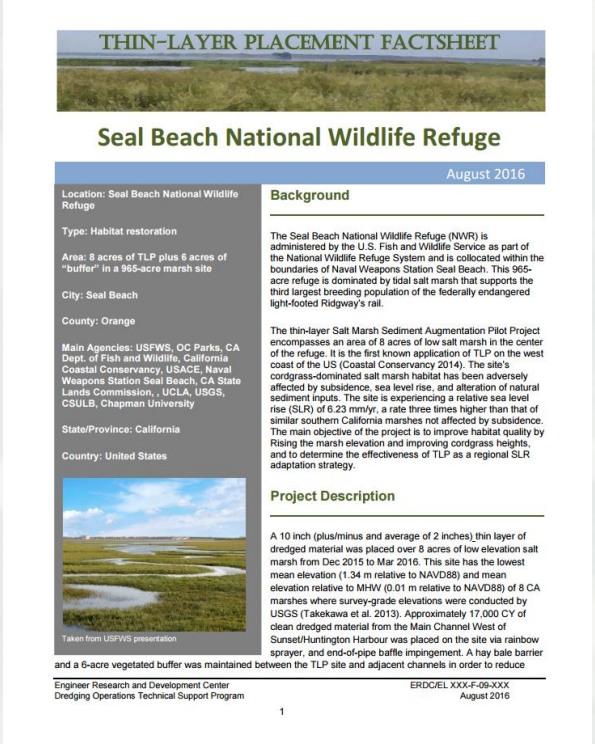
Year: 2016

Project Type(s): Marsh nourishment/habitat restoration

Project Description: The Seal Beach NWR's cordgrass dominated salt marsh habitat has been adversely affected by subsidence and sea level rise. The main objective of the Seal Beach project is to improve habitat quality and facilitate sea level rise (SLR) adaptation. An 8 to 10 in. thin layer of dredged material will be placed over 10 acres of a low elevation salt marsh in Oct-Jan 2015/2016. Approximately 10,000 to 13,500 CY of clean dredged material from the Main Channel West of Sunset Harbor will be placed on the site via rainbow sprayer, open pipe, or end-of-pipe baffle impingement. The dredged material placement is expected to take from 4 to 6 weeks. Monitoring of vegetation, sediment dynamics, elevation, invertebrates and birds communities, and wetland biogeochemistry is planned pre and post placement.

Fact Sheet Project Gallery Map-Based Portal Back to Top

Factsheet



THIN-LAYER PLACEMENT FACTSHEET

Seal Beach National Wildlife Refuge

August 2016

Location: Seal Beach National Wildlife Refuge

Type: Habitat restoration

Area: 8 acres of TLP plus 6 acres of "buffer" in a 965-acre marsh site

City: Seal Beach

County: Orange

Main Agencies: USFWS, OC Parks, CA Dept. of Fish and Wildlife, California Coastal Conservancy, USACE, Naval Weapons Station Seal Beach, CA State Lands Commission, , UCLA, USGS, CSULB, Chapman University

State/Province: California

Country: United States

Taken from USFWS presentation

Background

The Seal Beach National Wildlife Refuge (NWR) is administered by the U.S. Fish and Wildlife Service as part of the National Wildlife Refuge System and is collocated within the boundaries of Naval Weapons Station Seal Beach. This 965-acre refuge is dominated by tidal salt marsh that supports the third largest breeding population of the federally endangered light-footed Ridgway's rail.

The thin-layer Salt Marsh Sediment Augmentation Pilot Project encompasses an area of 8 acres of low salt marsh in the center of the refuge. It is the first known application of TLP on the west coast of the US (Coastal Conservancy 2014). The site's cordgrass-dominated salt marsh habitat has been adversely affected by subsidence, sea level rise, and alteration of natural sediment inputs. The site is experiencing a relative sea level rise (SLR) of 6.23 mm/yr, a rate three times higher than that of similar southern California marshes not affected by subsidence. The main objective of the project is to improve habitat quality by Rising the marsh elevation and improving cordgrass heights, and to determine the effectiveness of TLP as a regional SLR adaptation strategy.

Project Description

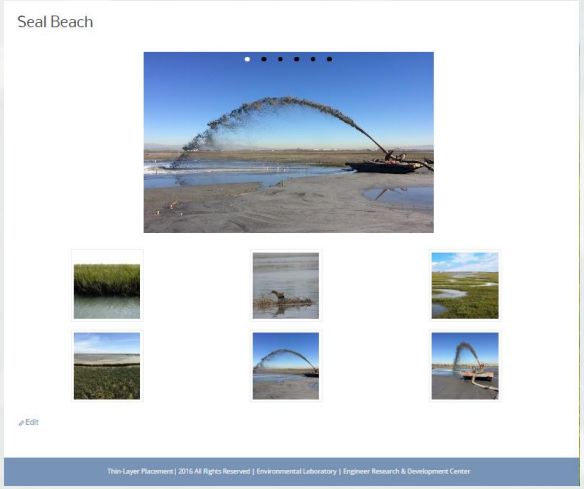
A 10 inch (plus/minus and average of 2 inches) thin layer of dredged material was placed over 8 acres of low elevation salt marsh from Dec 2015 to Mar 2016. This site has the lowest mean elevation (1.34 m relative to NAVD88) and mean elevation relative to MHW (0.01 m relative to NAVD88) of 8 CA marshes where survey-grade elevations were conducted by USGS (Takekawa et al. 2013). Approximately 17,000 CY of clean dredged material from the Main Channel West of Sunset/Huntington Harbour was placed on the site via rainbow sprayer, and end-of-pipe baffle impingement. A hay bale barrier and a 6-acre vegetated buffer was maintained between the TLP site and adjacent channels in order to reduce

Engineer Research and Development Center
Dredging Operations Technical Support Program

ERDC/EL XXX-F-09-XXX
August 2016

1

Gallery



Seal Beach

Edit

Thin-Layer Placement | 2016 All Rights Reserved | Environmental Laboratory | Engineer Research & Development Center

Funding for this project has been provided by:

U.S. Fish & Wildlife Service - 2015 Cooperative Recovery Initiative Grant
California Coastal Conservancy Grant
Orange County, OC Parks - Sediment and Application Contract
California Department of Fish and Wildlife - Greenhouse Gas Reduction Program
U.S. Army Corps of Engineers - Ecosystem Management & Restoration Research Program

U.S.ARMY

BUILDING STRONG®

ERDC

Innovative solutions for a safer, better world