

Constructing a Salt Marsh Restoration via Re-Use of Dredged Material

A CASE STUDY FROM AVALON, NJ

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Purpose

ERDC wants to address the following:

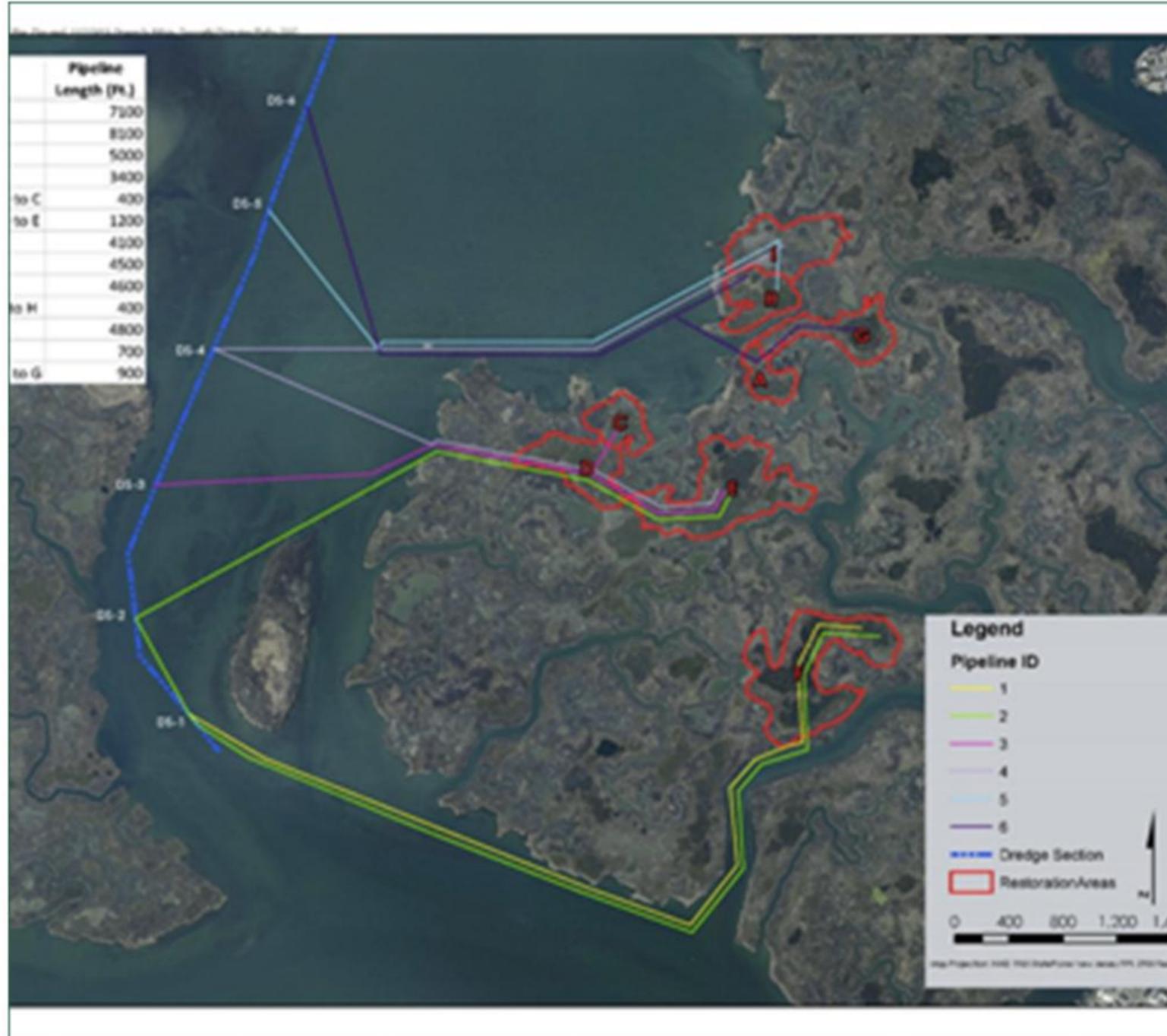
- Permitting
- Construction
- Performance monitoring

Project Background

- **Project site: Salt marsh island in Avalon, NJ**
- **Problem: Salt marsh integrity is threatened by expanding pools and pannes (exacerbated by sea level rise)**
- **Solution: Use dredged sediments to fill select pool/panne complexes and raise the elevation of the surrounding marsh within the local tidal range**
- **Status:**
 - **Permits granted**
 - **Placement of dredged material completed in February 2016**
 - **Planting scheduled for April 2017**

06/23/2015

Design recap



Permitting

- Permits required:
 - Coastal General Permit #24 for Habitat creation, restoration, enhancement
 - Clean Water Act Section 401 Water Quality Certificate
 - Coastal Zone Management Program Consistency Determination
- Project-specific conditions:
 - No dredging between April 1 and Aug 31
 - Max volume of dredged material
 - Permitted target elevations and volumes per area
 - Sediments w elevated levels of dioxins could only be placed within designated areas on the marsh (like-on-like)
 - Minimize/document dispersal of sediments beyond area boundaries
 - Minimize impact to marsh by equipment
 - Plant
 - Monitor

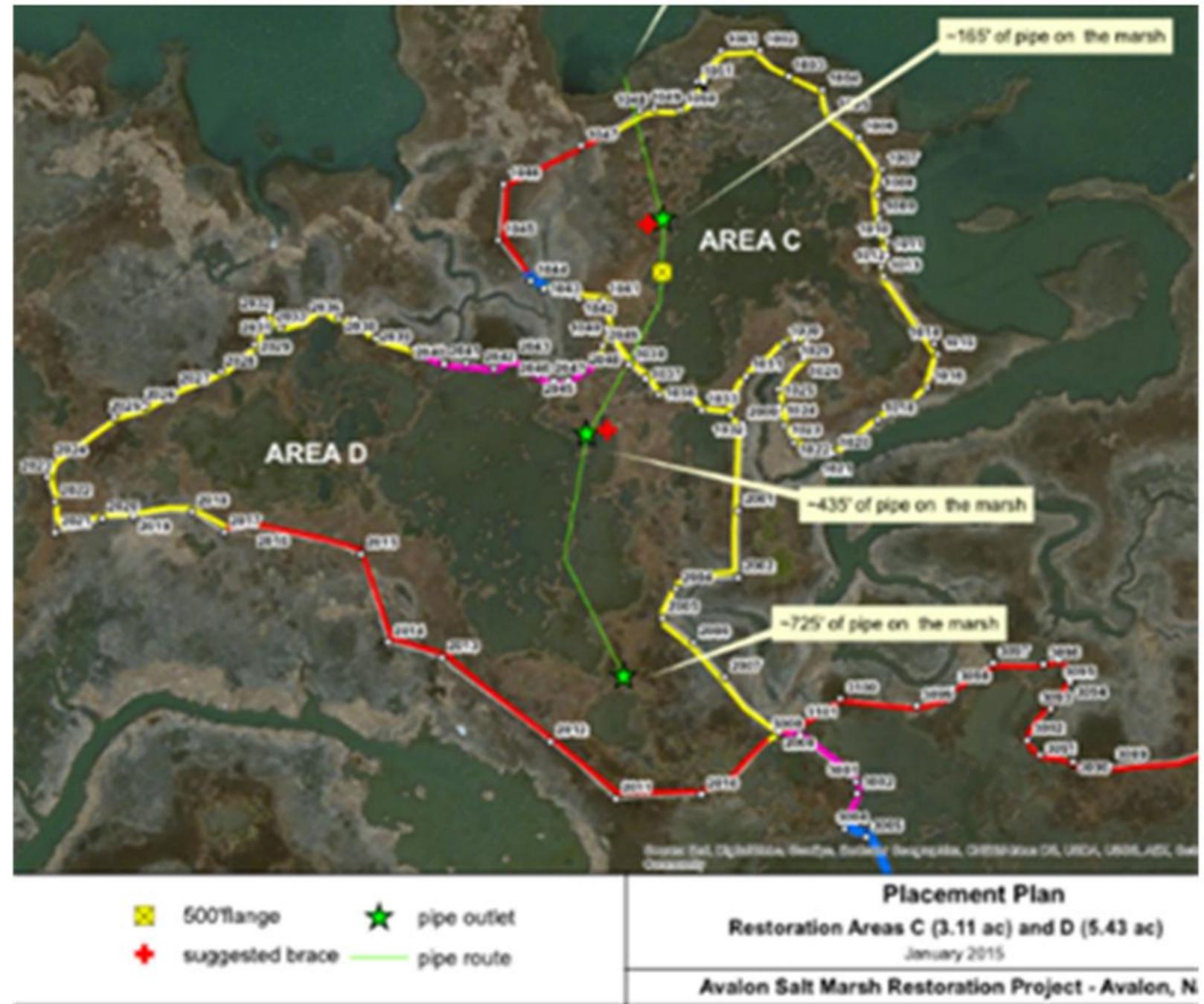
Construction



- 1. Pre-construction meetings: Summer- Fall 2015**
- 2. Site preparation: October- November 2015**
- 3. Sediment placement: Nov 23, 2015- Feb 20, 2016 (3 mo)**
- 4. Planting: April 2017**

Construction – Site Prep

- Perimeter stakeout & containment installation
- Grade stake installation
 - To mark target elevations
- Initial pipe set-up
 - Lay out pipe
 - crib pipe
 - outfit pipe outlet





Construction – Placement

- Placement in theory versus placement in reality
- Overtopping of containment because of “mini bathtubs”, preferred drainage routes and limited mobility of pipe
 - Needed to reinforce containment
 - Needed to move pipe or change pipe fitting
 - Needed to lay out safe walking paths
 - Needed to adjust pipe route to think several steps ahead
 - Needed daily work plans and weekly team meetings
- Extreme tides, high winds, winter storm



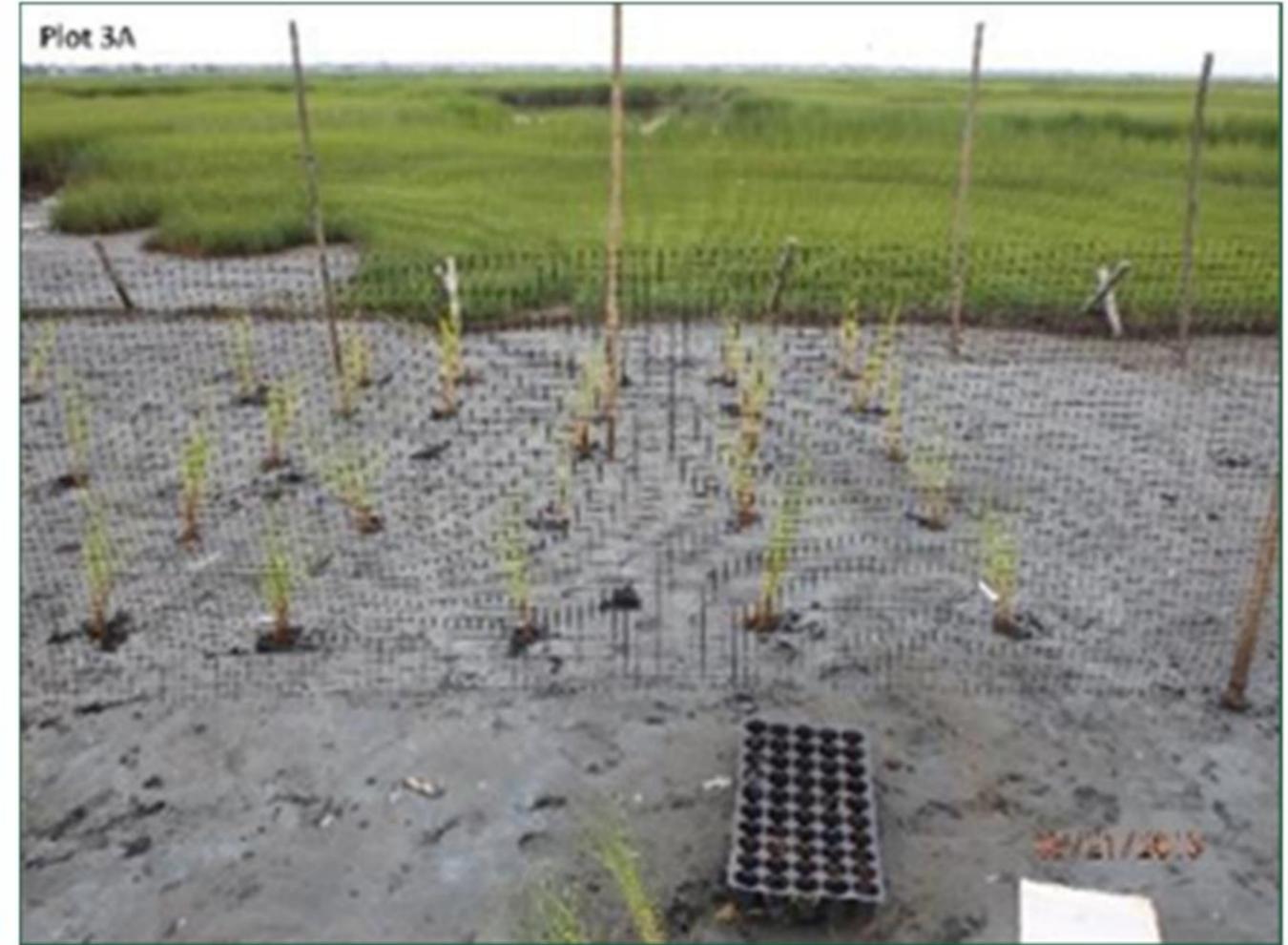




01/28/2016

Construction – Planting

- Natural recruitment vs. planting



Performance Monitoring

- Elevation
- Depth and duration of flooding
- Vegetation
- Wildlife communities
 - Fish
 - Birds
 - Macroinvertebrates
 - Benthic infauna
- Sediments
- Wave energy & flooding modelling
- Lessons learned
- Cost analysis

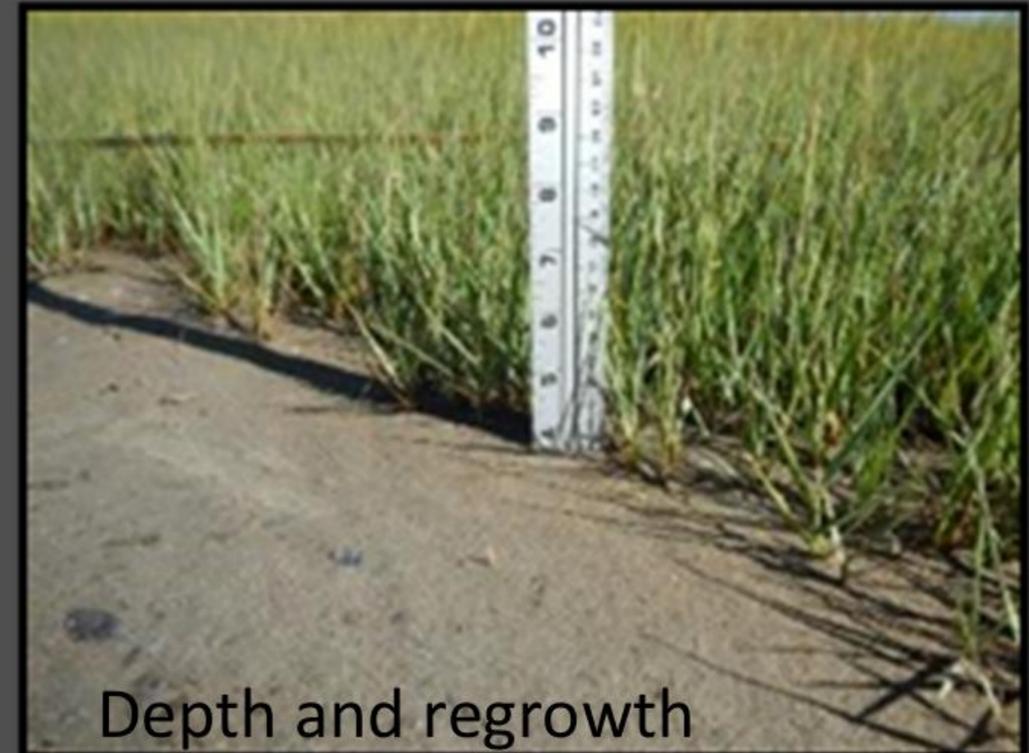


Additional Informal Monitoring: Monthly Site Visits

Observations and photos:

- Fixed photo points
- Containment
- Interesting plant recovery and die off
- Depths of placement
- Pooling
- Wildlife
- Etc.

Fixed photo points



Depth and regrowth



Preliminary Results



April 30, 2015



June 10, 2015



April 25, 2016

04/25/2016

Sediment Dynamics Post-Placement



Thank you.

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