

Engineering With Nature Case Examples of Practice

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Gloucester, MA**



Organizational Perspective

- Navigation mission: maintain federal channels in the Philadelphia District
- Regional Sediment Management approach is to keep the sediment in the natural system
- Strong beach nourishment program (borrow areas)
- Regulatory mission





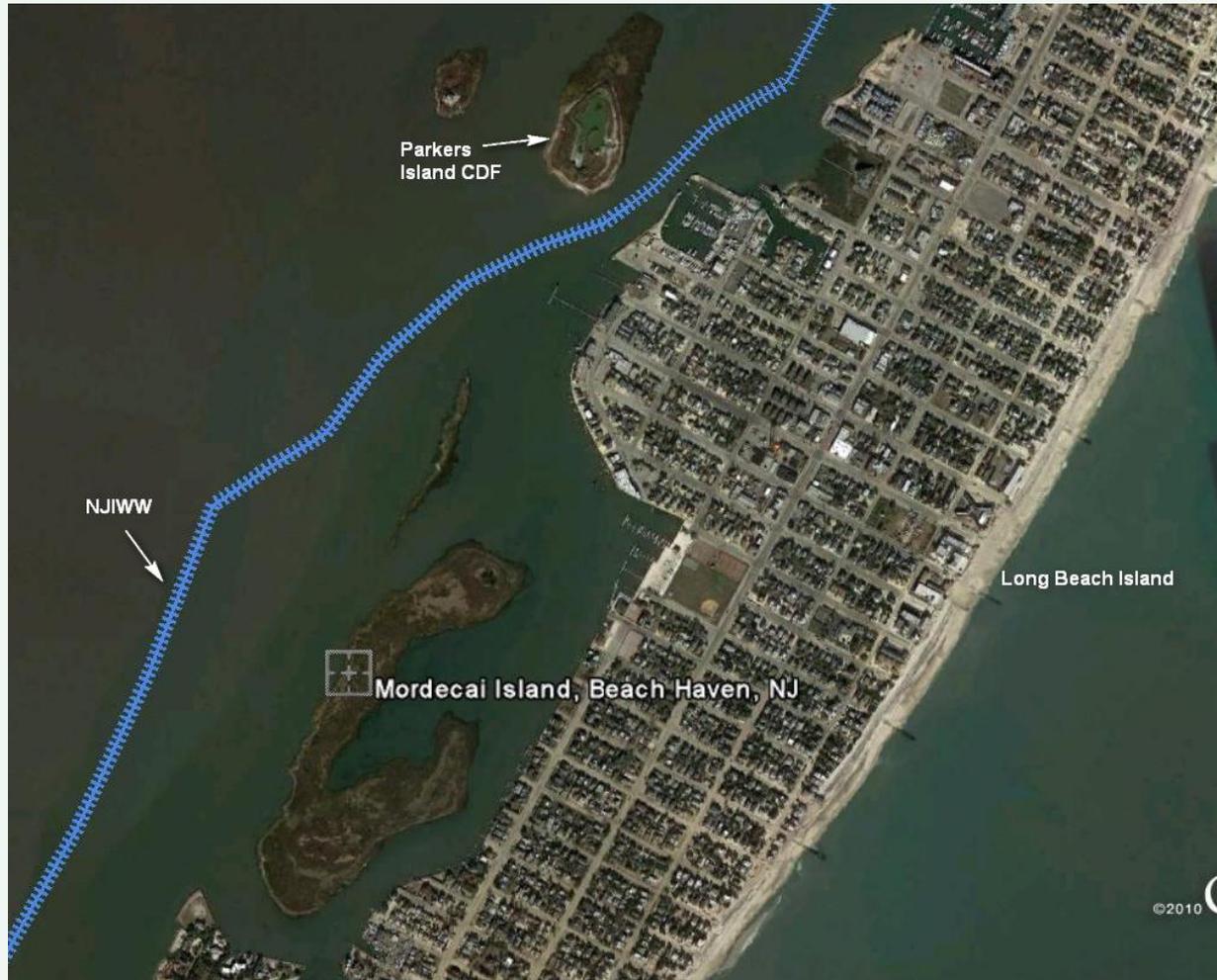
**USACE Philadelphia District
Federal Navigation Projects**

Current Projects

- Dredging of coastal inlets with USACE plant
- Post-Sandy actions to dredge federal channels and place beneficially to restore the system and build coastal resilience
 - Ring Island (August 2014)
 - Mordecai Island (November 2015)
 - Avalon (February 2016)
 - Barnegat Bay placement sites



Mordecai Island, Beach Haven, NJ



Mordecai Island CONSTRUCTED! November 2015



Mordecai Island Plantings

May 2016



Mordecai Island

9 months after construction



Mordecai Island

9 months after construction

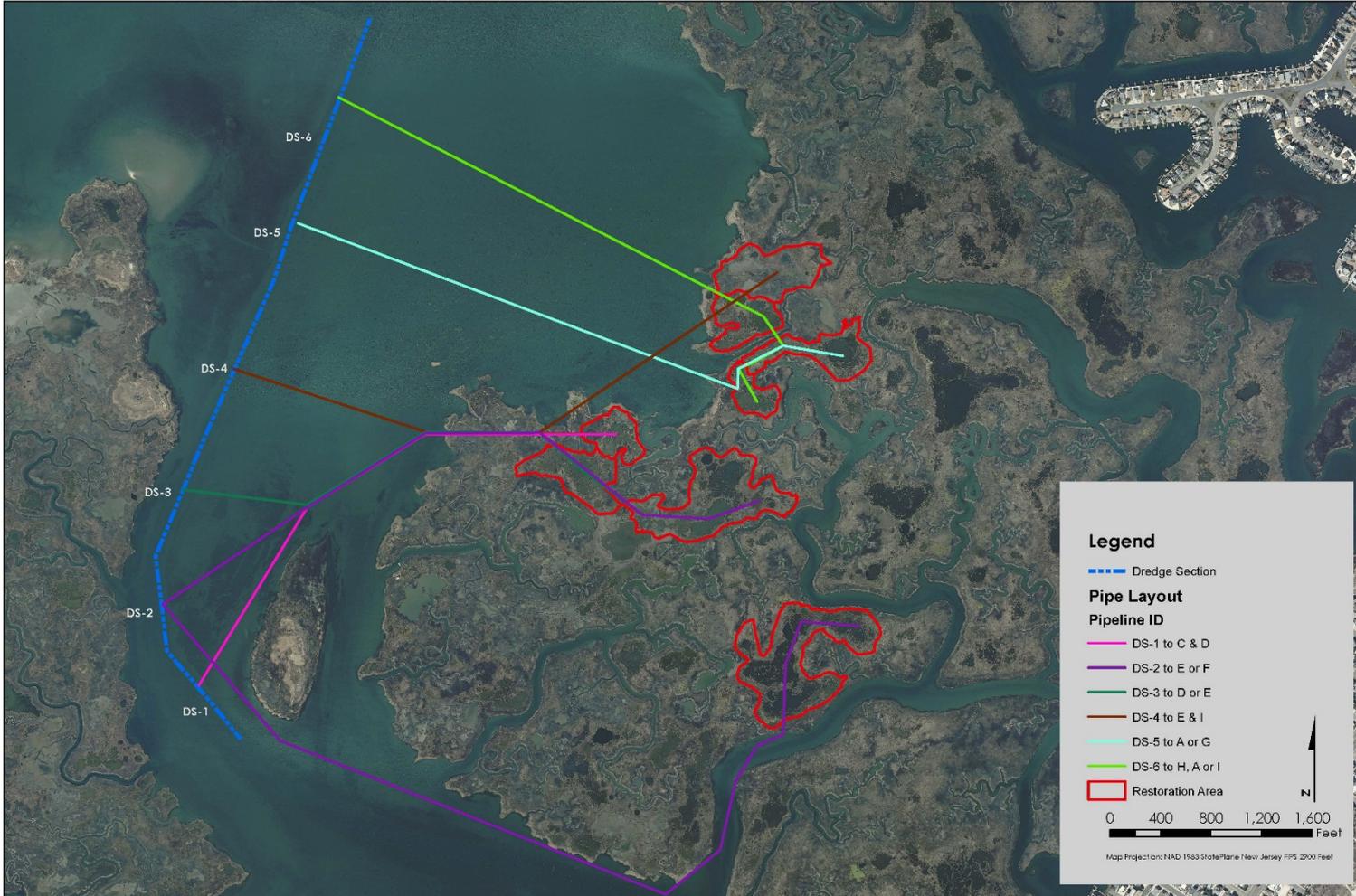


Ring Island, Middle Township, NJ Constructed August 2014



NJIWW Dredging & Avalon Placement Thin Layer Placement Project Constructed Nov 2015 to Feb 2016

File: P:\13651\Project\1560046_Avalon\075\MOD\15015\020\Drawings_Map_Trim_RTE.mxd, 10/26/2016, Drawn by Akshay, Copyright Princeton Hydro, LLC



THIN LAYER DREDGE
PIPE LAYOUT CONFIGURATION
Avalon, New Jersey

PRINCETON HYDRO, LLC
1188 OLD YORK ROAD
P.O. BOX 720
BRIDGEVILLE, NJ 08001
NJ 08001-0720



NJIWW Avalon Pilot Project: Dredging “The Football Field” and Thin-layer Placement

- Pilot Project constructed Dec 2014
- Small thin layer placement demo with fine-grained material and filled pools and pannes to restore marsh
- Larger project continued from Nov 2015 to Feb 2016 (approx. 45,000 cy)
- Monitoring to continue for several years



Significant Outcomes/Value Produced

- Ongoing Monitoring
- Lessons learned on criteria, design and constructability for future restoration projects
- Work contributes to healthy ecosystems and EWN approach; supports adjacent NMFS resources
- Supports coastal resiliency and sustainability efforts



Challenges

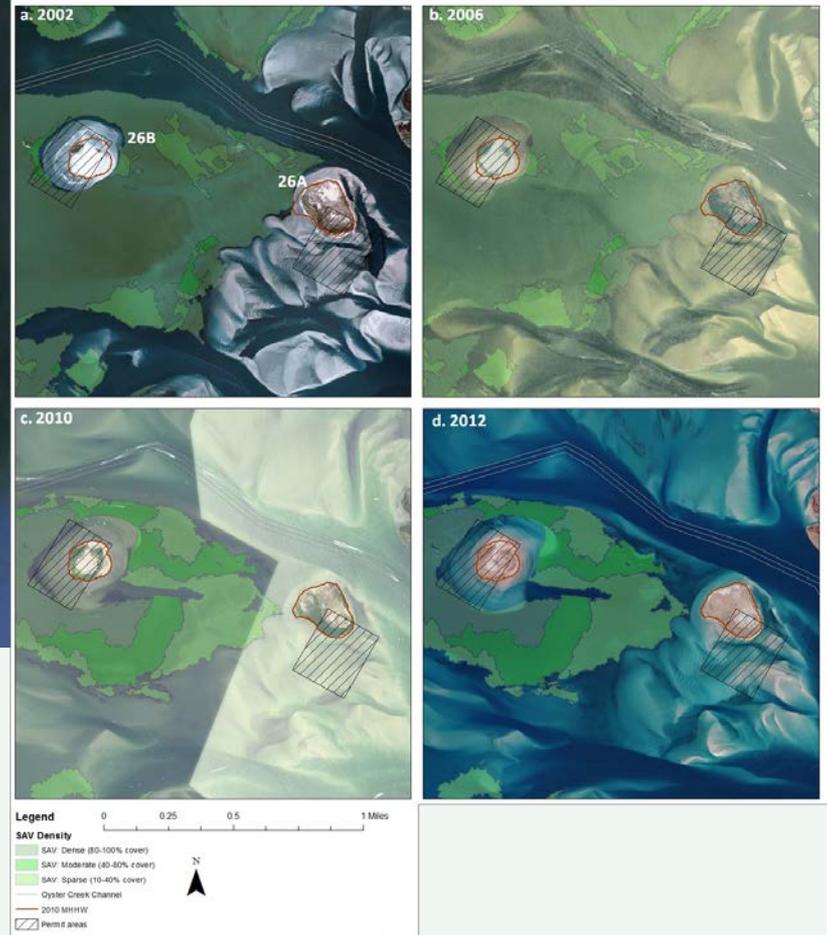
- Need better consensus *between and within agencies* on how to evaluate projects and what defines success
- Balance impacts and benefits, criteria are subjective
- Variability in state permit requirements
- Environmental windows to accomplish work

Future Opportunities

- Island Creation in coastal NJ and DE
- Dredge Hole infilling
- Marsh Restoration
 - Thin layer
 - Edge restoration
- Working together to inform science-based decisions and projects



Barnegat Inlet, NJ



Barneгат Inlet

Post-Sandy CHARTS Survey

