

Engineering With Nature Case Examples of Practice

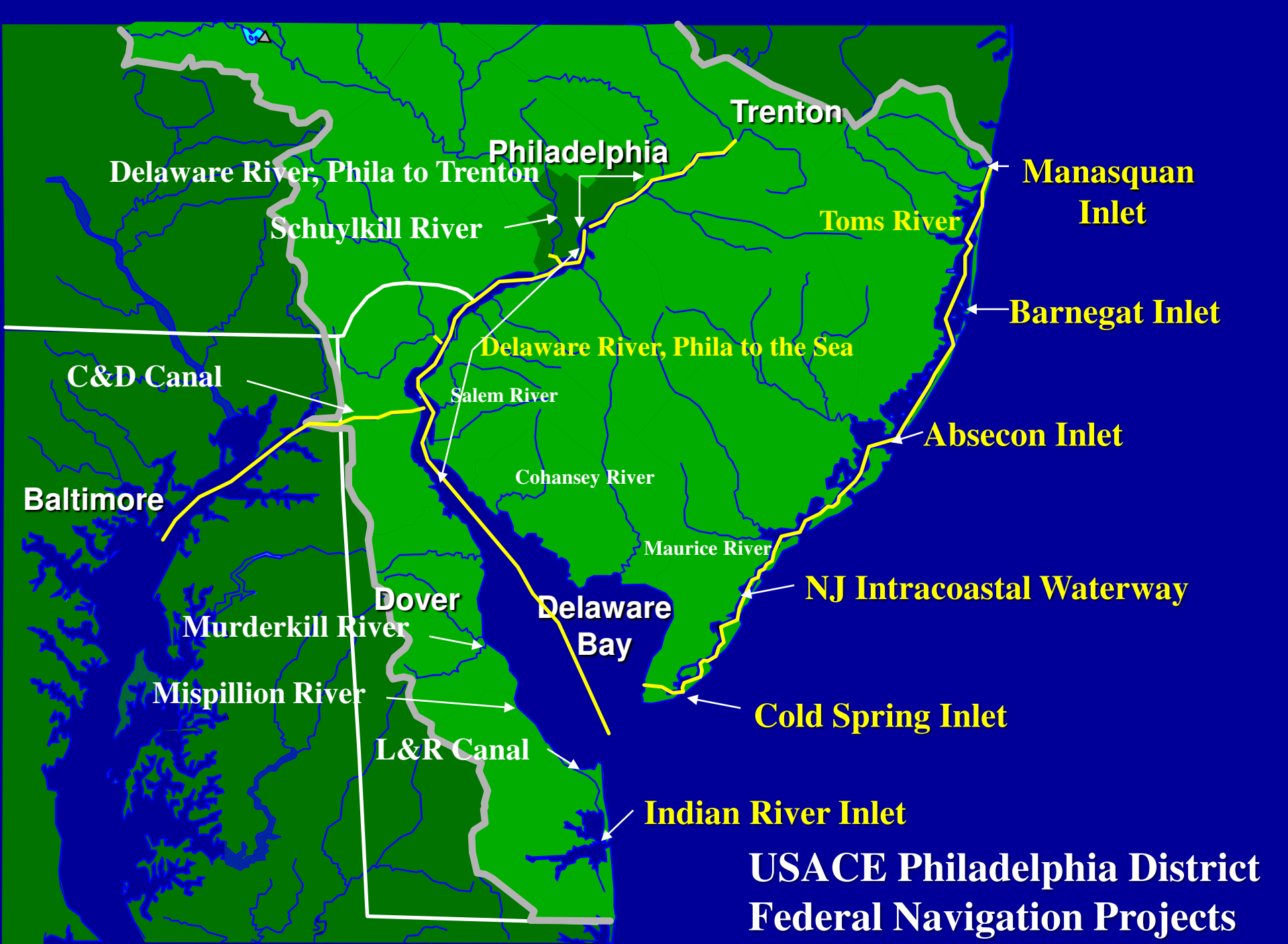
**Monica Chasten
USACE, Philadelphia District
Operations Division**

**05-06 October 2016
Gloucester, MA**



Organizational Perspective

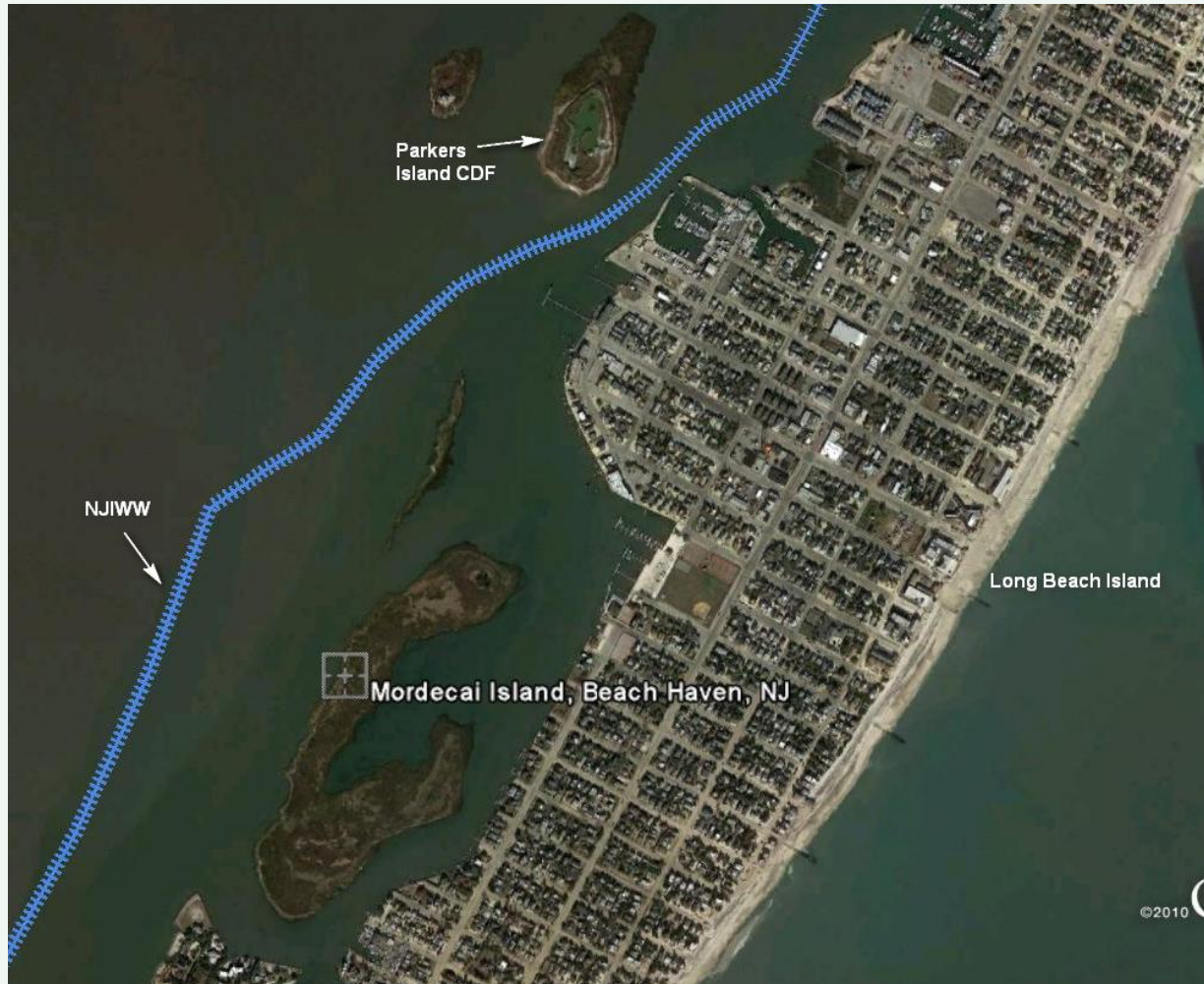
- Navigation mission: maintain federal channels in the Philadelphia District
- Regional Sediment Management approach is to keep the sediment in the natural system
- Strong beach nourishment program (borrow areas)
- Regulatory mission



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

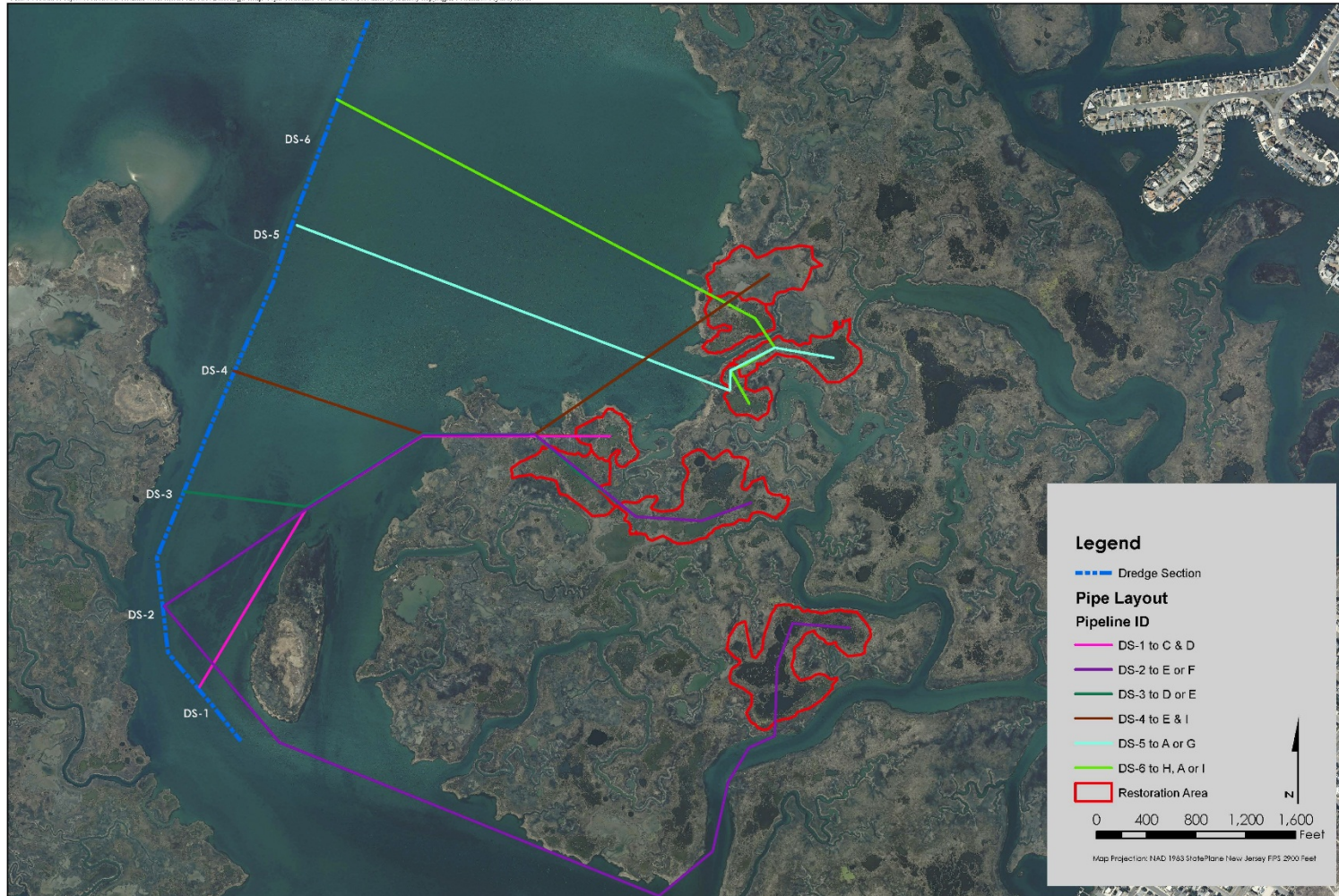


Ring Island, Middle Township, NJ Constructed August 2014



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

File: P:\13651\Projects\1560006_Avalon\GIS\Map\1560006_Dredging_Map_Pipe_RTE.mxd, 10/26/2016, Drawn by Mblain, Copyright Princeton Hydro, LLC



**THIN LAYER DREDGE
PIPE LAYOUT CONFIGURATION**
Avalon, New Jersey

PH PRINCETON HYDRO, LLC
1188 OLD YORK ROAD
P.O. BOX 720
RINGGERS, NJ 08551
908.997.9622

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

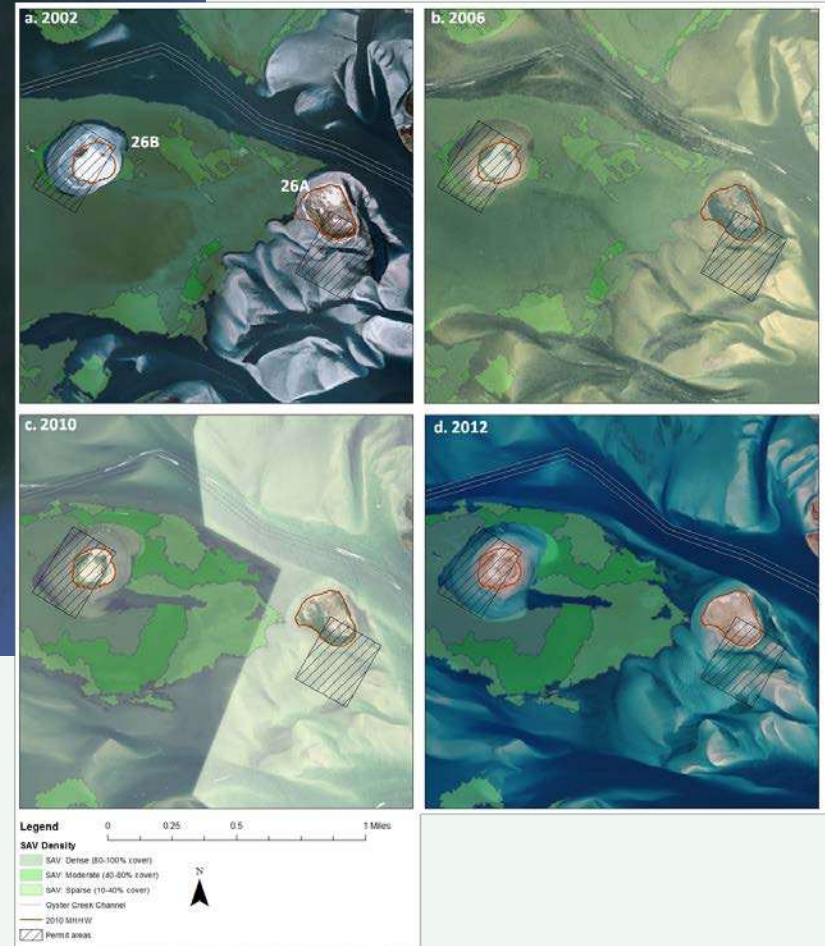
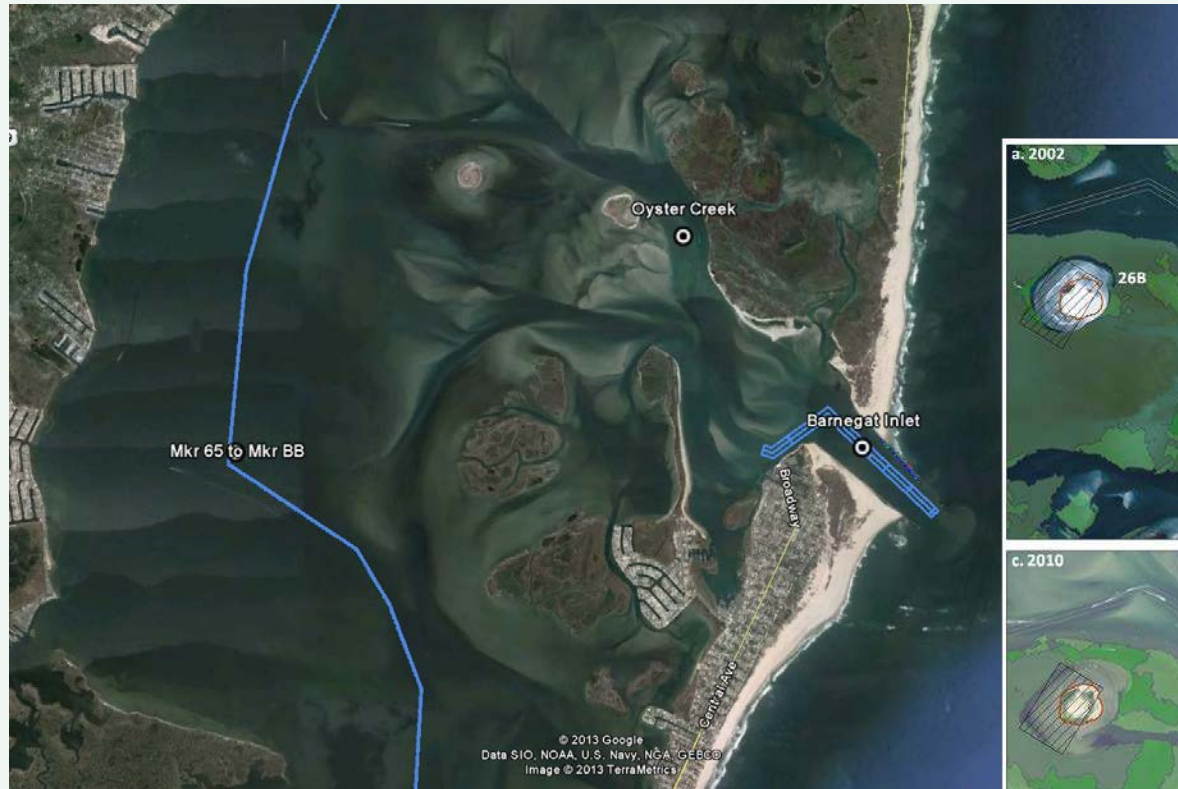
Challenges

- 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



Barnegat Inlet

Post-Sandy CHARTS Survey

