

EXPERIENCES WITH THE USE OF GEOTEXTILE TUBES TO DEWATER NAVIGATIONAL DREDGED MATERIAL IN COASTAL NEW JERSEY

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NJDOT OMR OVERVIEW

- Historically, beach replenishment or stored in CDFs
- Innovative strategies for dredged material management

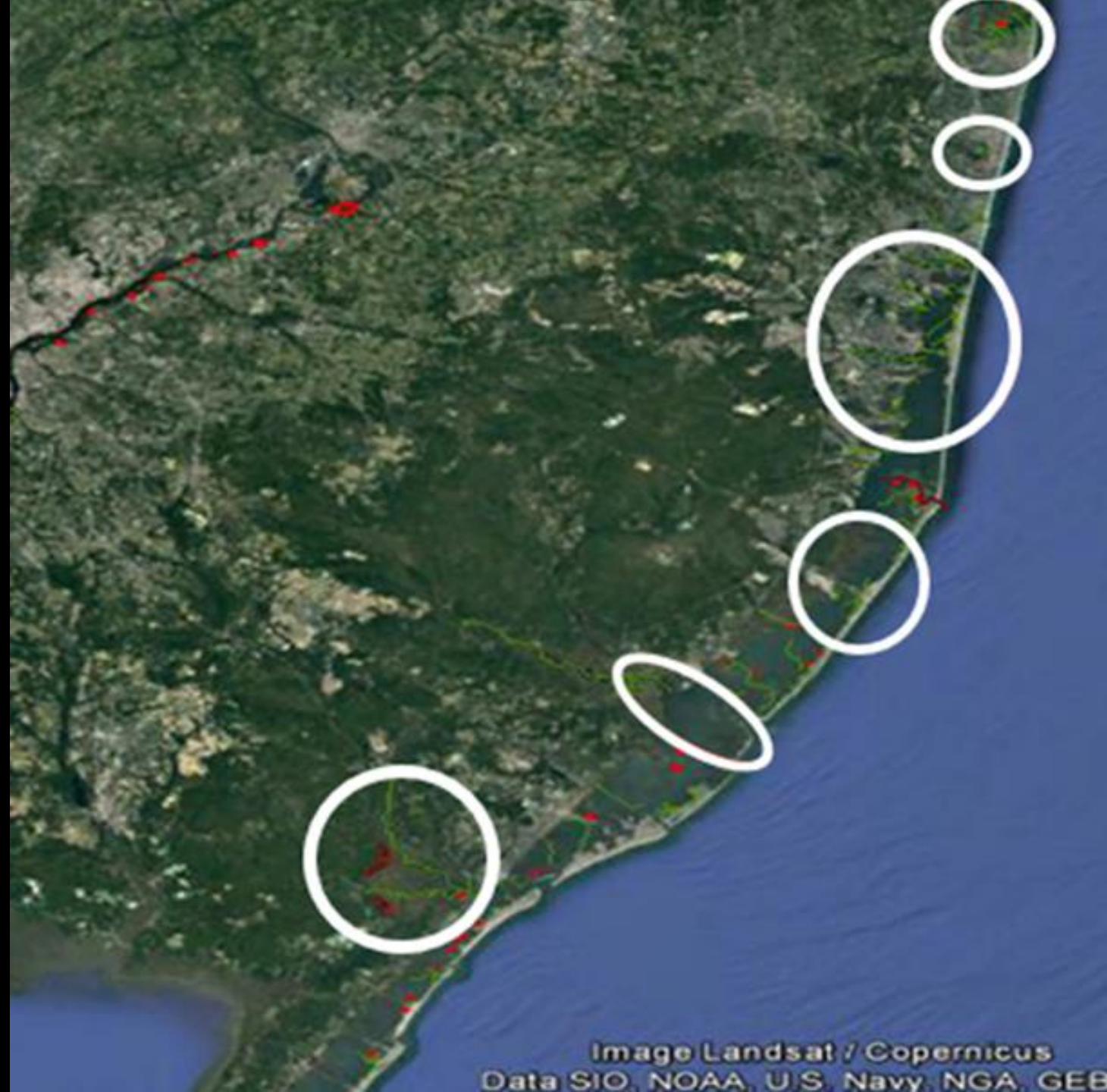


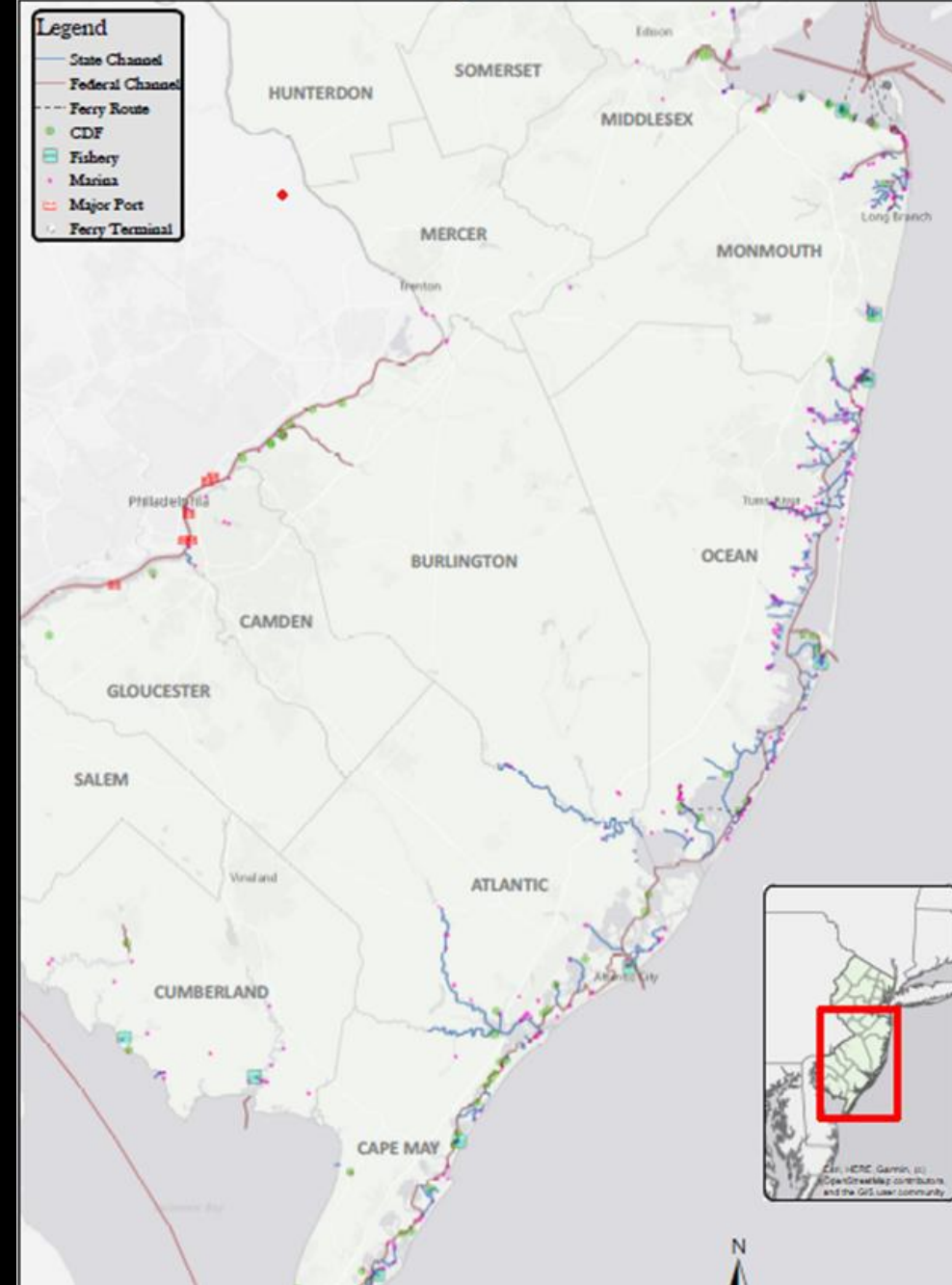
Image Landsat / Copernicus
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

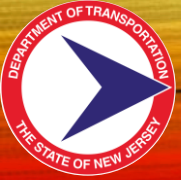


ATLANTIC COASTAL ZONE OF NEW JERSEY

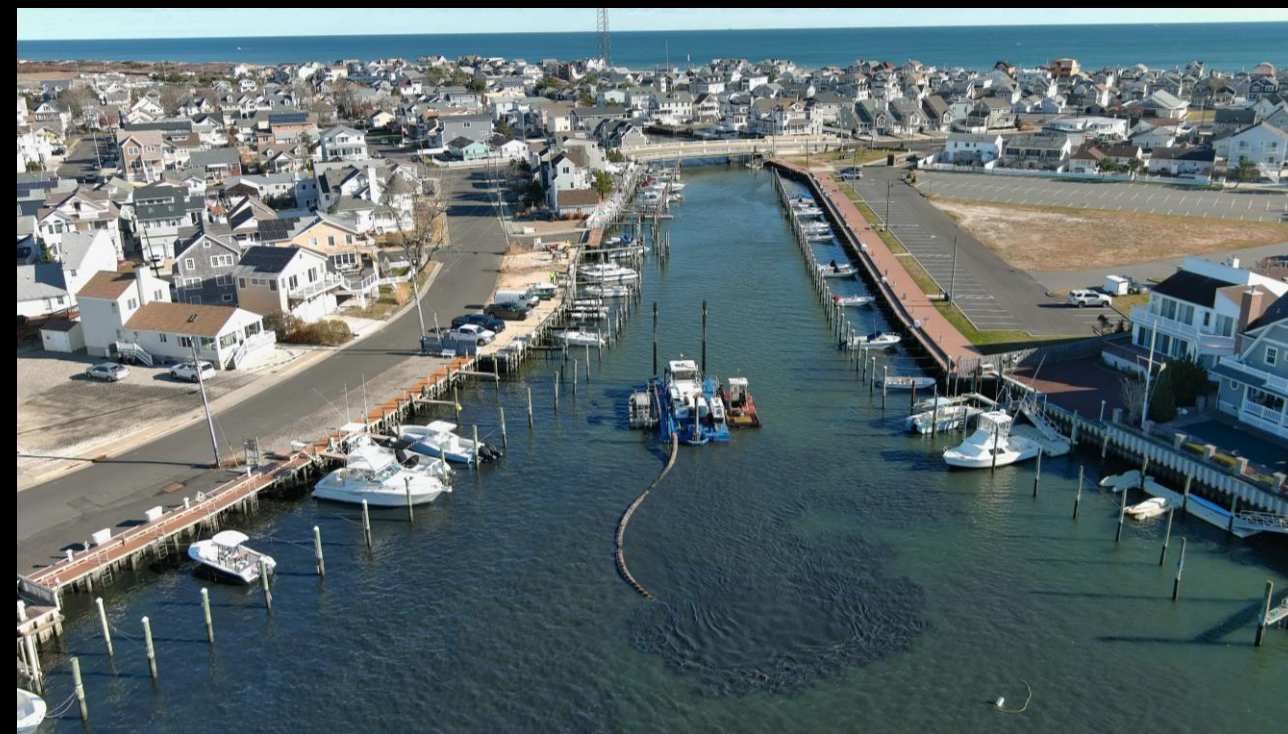
- 190 marked & maintained state channels; seven (7) inlet channels
- 400 marinas, 325 boat ramps, 235 commercial fishing slips
- 250 water dependent businesses
- 40,000 private boat slips

New Jersey Atlantic Coastal Zone Marine Transportation Features





NJDOT OMR – USE OF GEOTEXTILE TUBES OVERVIEW



- Suitable placement sites are not always available
- Onsite dewatering
 - Active methods (hydrocyclones and belt filter presses)
 - Passive methods (retention basins or geotextile tubes)



WHAT'S A GEO-TUBE

- Manufactured to any custom size;
- Able to be placed on top of one another;
- Includes the use of a containment area;
- Viable option for both small and large projects in terms of capacity for material and/or project site footprint.





HOW DO THEY WORK?

- Tubes are filled via a manifold,
- Water quality polymers and coagulants are used;
- Continuous observation with regular agitation;
- Tubes dewater over several weeks.
- Excavated and trucked offsite if desired.





GEOTUBE EXCAVATION





CASE STUDY SUMMARIES

Project	Dredging Need (CY)	Dredging Window	Dredged material management options	Other constraints
Shark River	105,000	July 1 - Dec 31	None available	Small sites with limited availability in close proximity to residences
Manasquan Phase II	88,000	July 1 – Dec 31	CDF at capacity, no restoration opportunities	Limited site availability, highly developed tourist area, in close proximity to residences
Absecon Creek	71,000	July 1 – Dec 31	Poor site conditions in CDF, insufficient capacity for traditional use	Long pumping distances over sensitive coastal habitat
West Creek	100,000	Sept 1 – Dec 31	Poor site conditions in CDF, insufficient capacity for traditional use	Close proximity to residences and sensitive coastal habitat



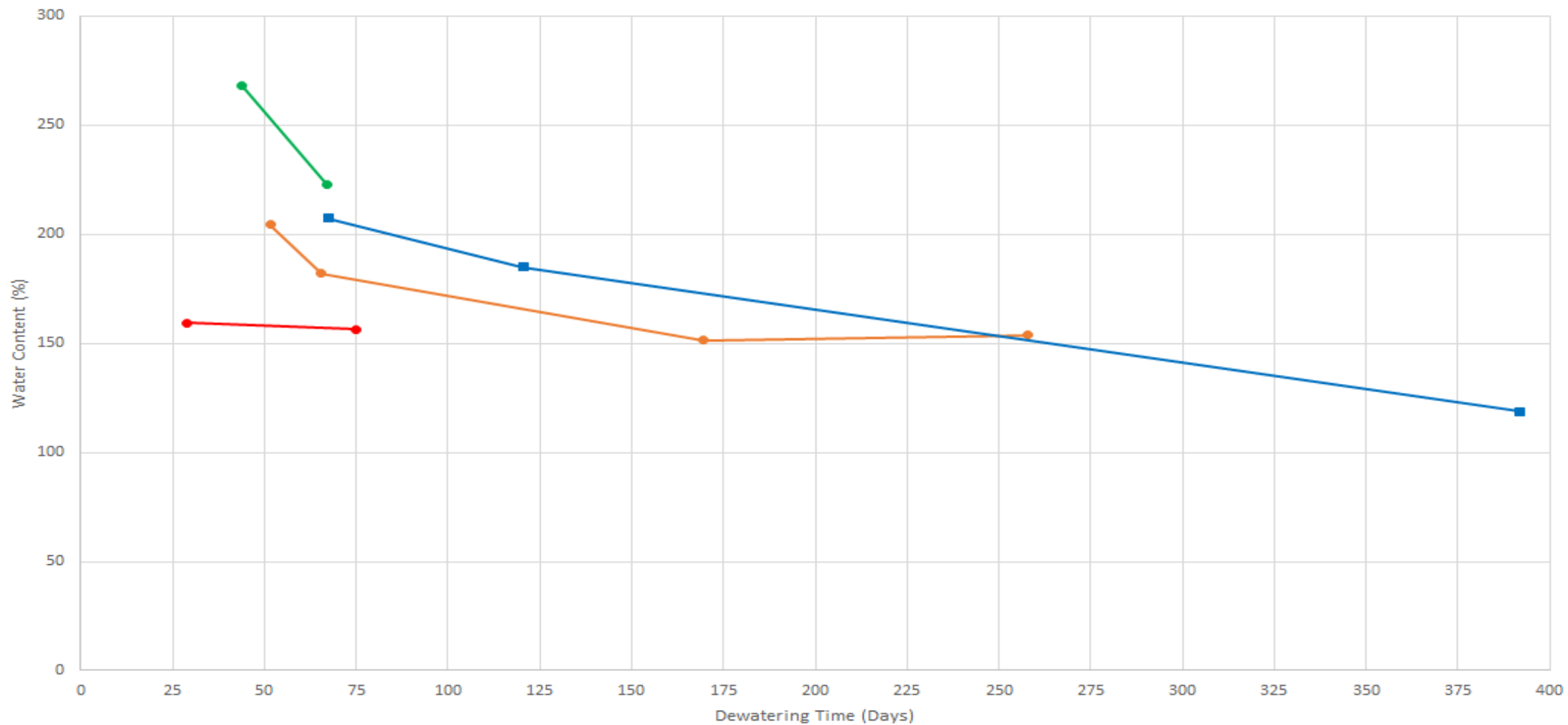
CASE STUDY SUMMARIES

Project	Volume Dredged (CY)	Dredging Days / Calendar Days	CY per day	Processing Area (acres)	# of Tubes Deployed	Minimum Dewatering Time (days)	Project Cost/CY* (US \$)
Shark River	24,619	64/121	385	1.3 / 2.5**	25	136 / 172**	100.20
Absecon Creek	70,730	72/98	982	14	45	All material remains on site	84.61
Manasquan	36,332	44/65	826	2.4	21	29	142.34
West Creek I and II	110,680	103/113	1075	14	94	All material remains on site	130.78



AVG WATER CONTENT VS. DEWATERING TIME

Average Water Content vs. Dewatering Time



Absecon West Creek Phase 1 West Creek Phase 2 Manasquan



Polymer Treatment

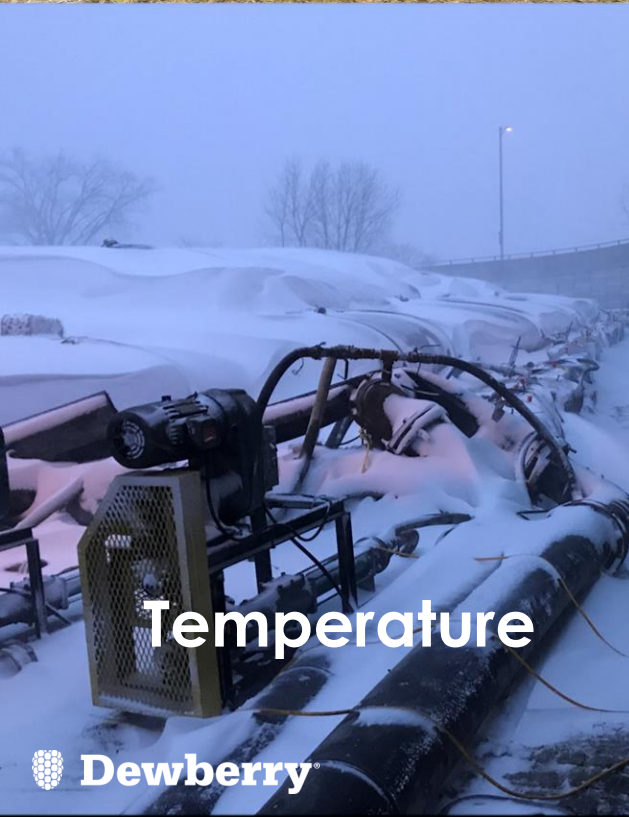


Geo-Tube Rupture

LESSONS LEARNED



Dewatering Delays



Temperature



Geo-bag Rolling



Residential Proximity



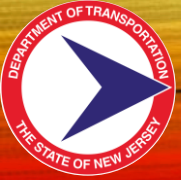
POLYMER TREATMENT SYSTEM





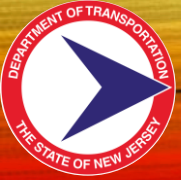
GEO-TUBE/CONTAINMENT BREACH





ROLLING GEOTEXTILE TUBES





FILLING SEQUENCE



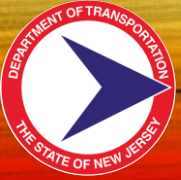


NIMBY: RESIDENTIAL PROXIMITY



DEWATERING AND EQUIPMENT DELAYS





FREEZING TEMPERATURE DELAYS





SUMMARY

- Successfully deployed for maintenance dredging projects (small site footprint; highly developed areas)
- Containment Area Design
- Proper methodologies and oversight of the operation is critical (polymer dosage and geotextile tubes);
- Risk mitigation
- Communication is key
- Community Relations





QUESTIONS



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