New Jersey Department of Transportation
Office of Maritime Resources

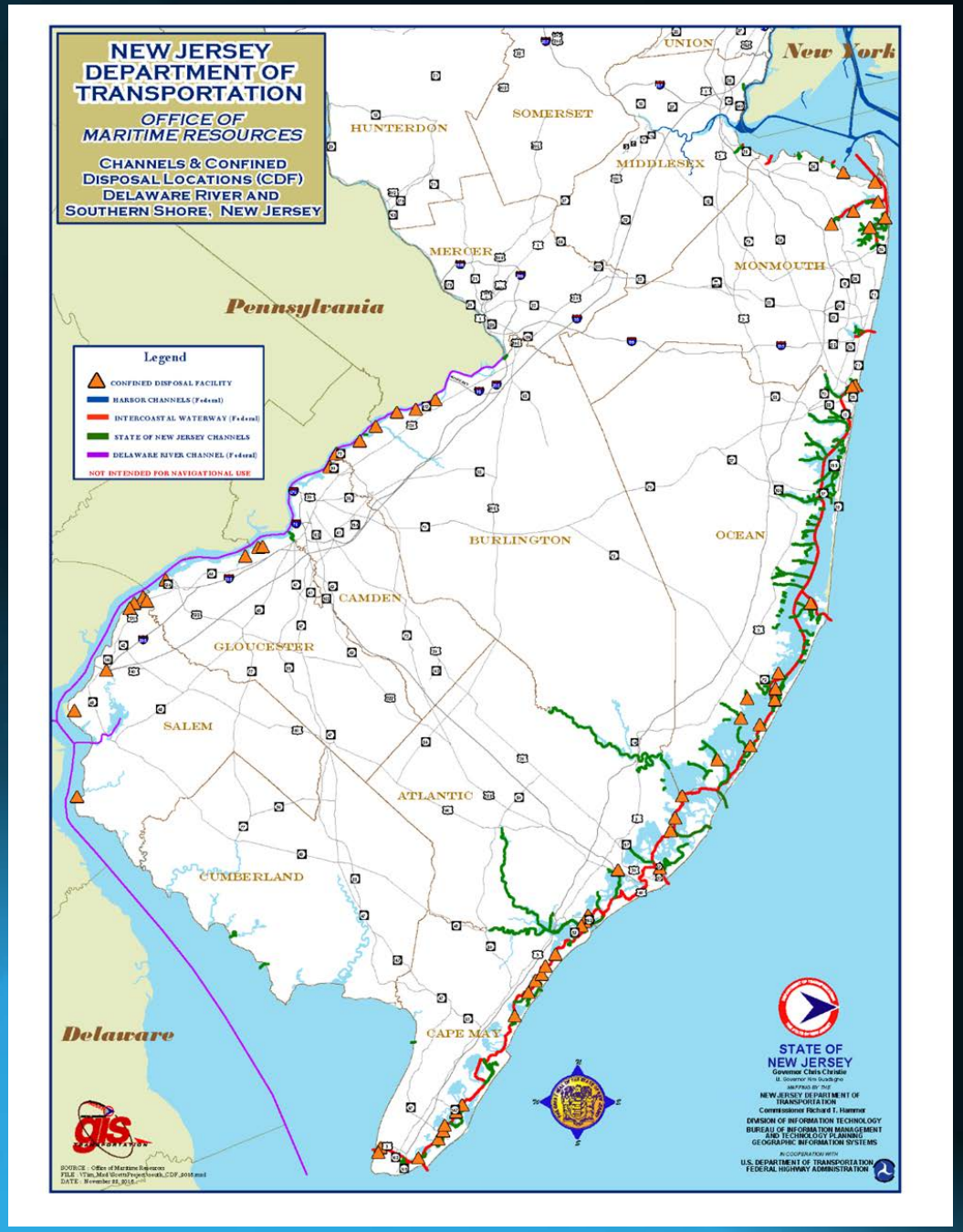
Dredging the Manasquan River Complex

Creating Capacity, Beneficial Use through Beach Renourishment, and Enhancing the Greater Good of the Manasquan Inlet Area

W. Scott Douglas and William Henderson, NJ Dept. of Transportation
Michael Marano and Tse-Wei (Jerry) Chen, WSP USA, Inc
and Sean Flanigan, Gahagan and Bryant Associates

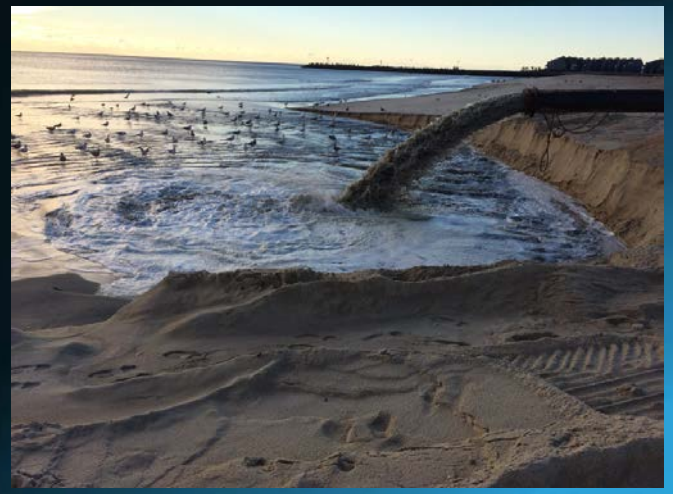
New Jersey's Marine Transportation System

- Federal Channels in NY/NJ Harbor, Delaware River, and NJ Intracoastal Waterway; over 400 nautical miles (nm) or 750 km of engineered waterways
- State Channel Network - 215 Marked and Identified Channels; over 200 nm (375 km) of engineered waterways
- Two International Ports (PONYNJ and South Jersey Port Corporation)
- Internationally recognized tourism destination
- World Class Fishery (most lucrative shellfishery in the U.S.)
- Worth over $50 billion annually to the New Jersey economy



Atlantic Shore Region

- 200 nm (375 km) of State channels
- Federal Intracoastal Waterway
- 500,000 cy (380,000 m3 +/-) per year of material ranging from sand to silt
- Hydraulic cutterhead pipeline dredging to CDFs for silt or beachfill for sand
- Historically handled by Bureau of Coastal Engineering at NJDEP



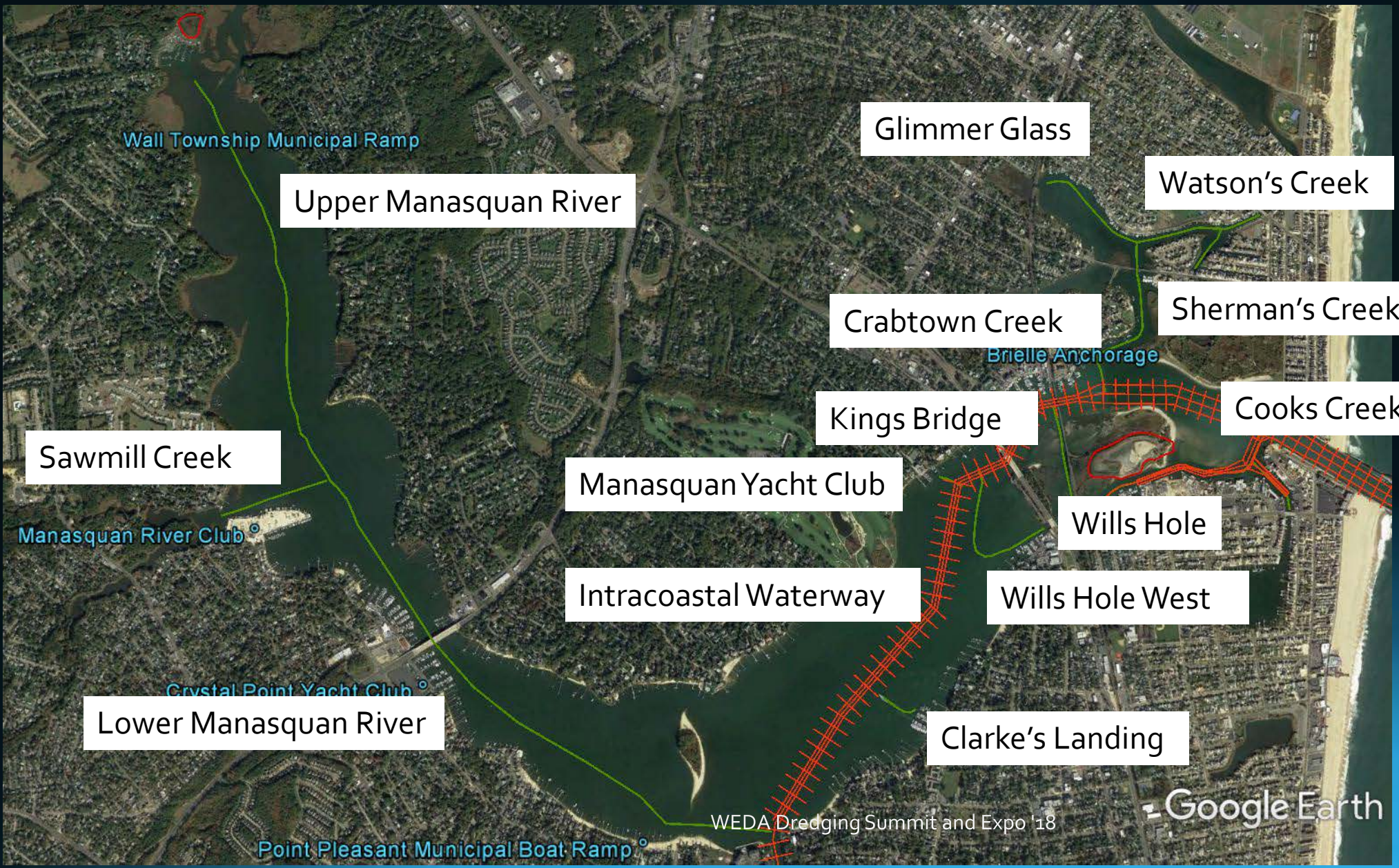
Dredged Material Management

- **Confined Disposal**
- **Beach Replenishment**
- Beneficial Use / Renewable capacity
- Marsh Restoration
- Mechanical Dewatering
- Asset Management Strategies
- Regional Sediment Management

Manasquan River and Inlet

- 50 water-dependent businesses
- Commercial fishing fleet
- USCG S.A.R.
- 2 major bathing beaches
- Multiple public parks
- Important bird area
- Ocean and riverside residences

Manasquan Marine Transportation System

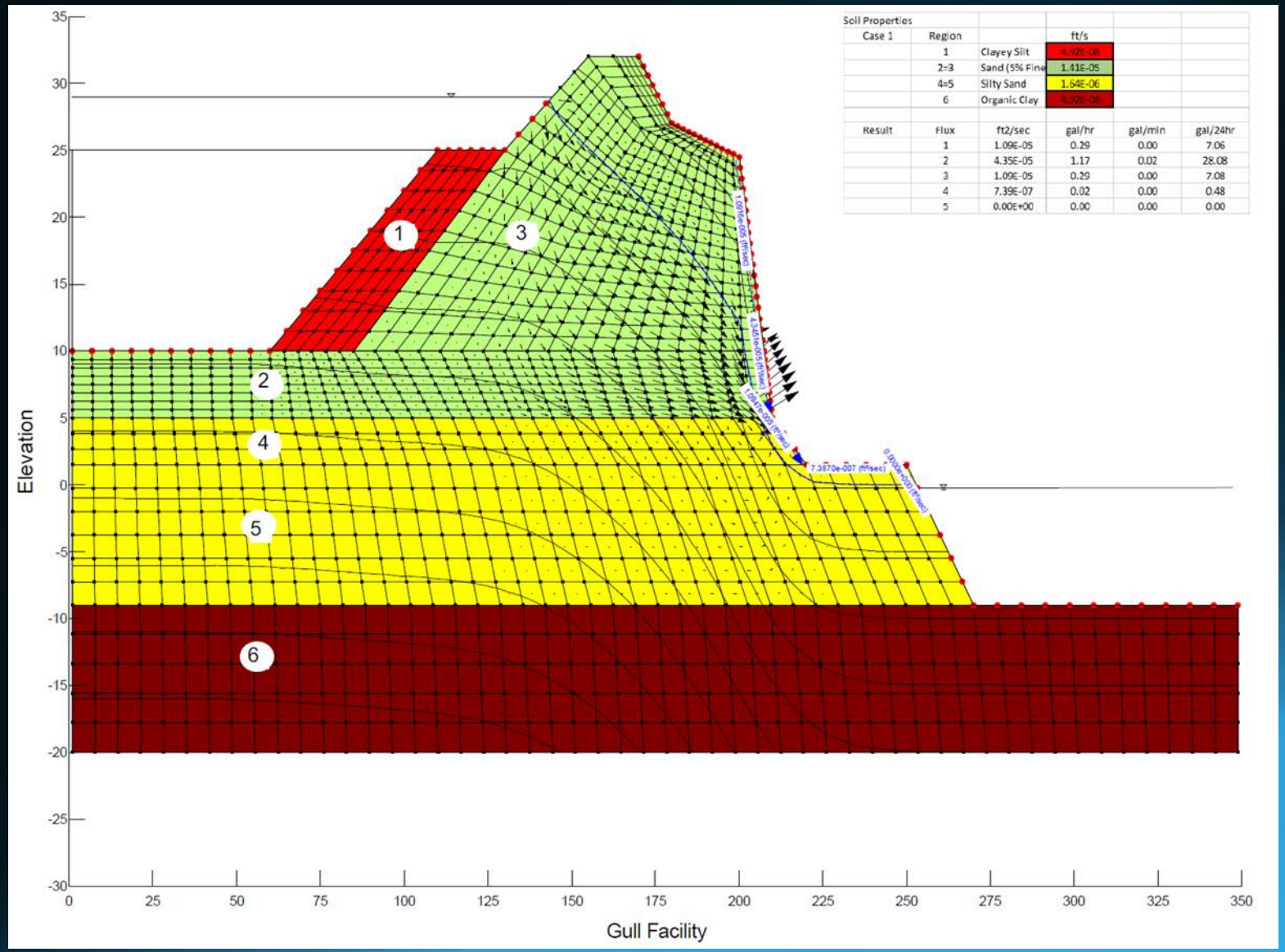


- 13 State Channels (6 nm) authorized from -5 to -13 ft (-1.5 m to-4 m) MLW
- Intercoastal Waterway -2.3 nm (4.26 km) authorized to -6 ft (-1.8 m) MLW
- 16 marinas
- 4 public boat ramps
- Commercial fishing pier
- 300,000 cyd (230,000 m3)of dredging needed

Gull Island CDF

- 9 acre (3.5 Ha.) site on 22 acre (8.9 Ha.) island
- Remaining air capacity of 26,000 cyd (19,900 m3)
- Existing berm height at 30 feet (10 m)
- History of erosion and sloughing

Stability Analysis



- Existing slopes between 1.5 and 2:1, or worse in isolated areas
- Soft organic peat layer at -10 feet (-3.0 m)

Manasquan Beach

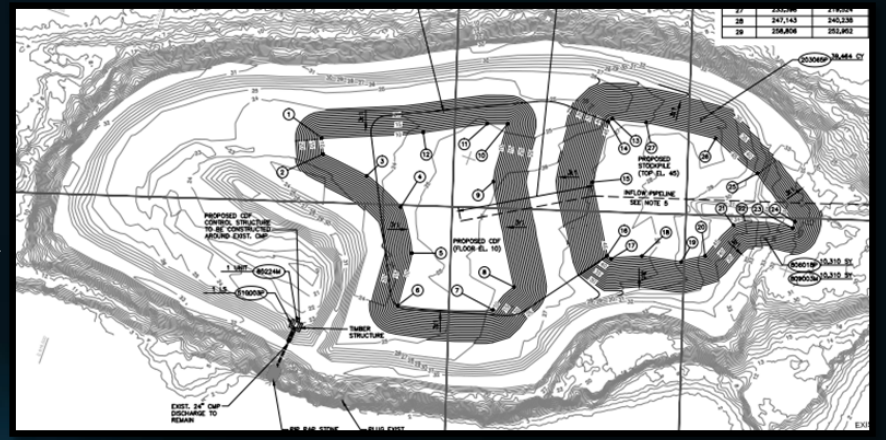
- Heavily used bathing beach, only available after October 1
- Must be greater than 90% sand – no shell or rocks allowed
- Essentially unlimited capacity

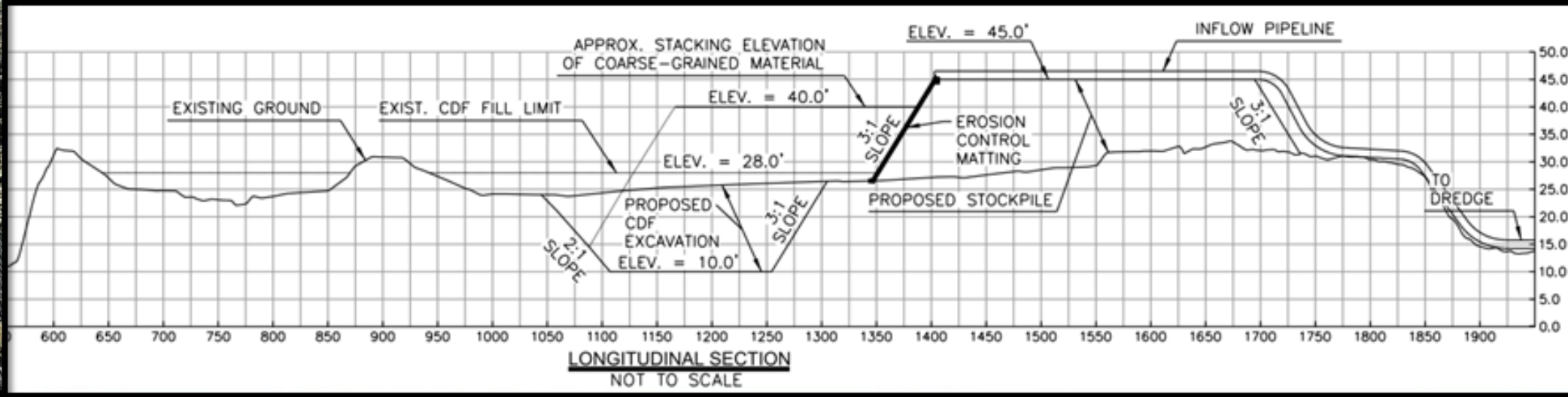
Project Decision Matrix

Channel	Shoaling Status	Usage	Economic Value	Logistical Constraints - Distance to the CDF ft. (M)	Volume CY (CM)	Dredge Material Composition	Final Rank
Lower Manasquan River	Moderate	High	Moderate	18,000 (5,490)	35,694 (27,290)	35.9% coarse (upper) 92.7% coarse (lower)	High
Crabtown Creek	Severe	Moderate	Low	4,750 (1,450)	10,763 (8,230)	44.5% coarse	High
Kings Bridge Channel	Moderate	Low	Low	3,250 (990)	8,681 (6,640)	55.7% coarse	Mod
Wills Hole Thorofare	Moderate	Low	High	2,750 (840)	45,899 (35,100)	72.3% coarse (upper) 91% coarse (lower)	High
Wills Hole West	Moderate	Low	Low	7,500 (2,290)	12,827	68.5% coarse	Mod

Creating Capacity (where there is none)

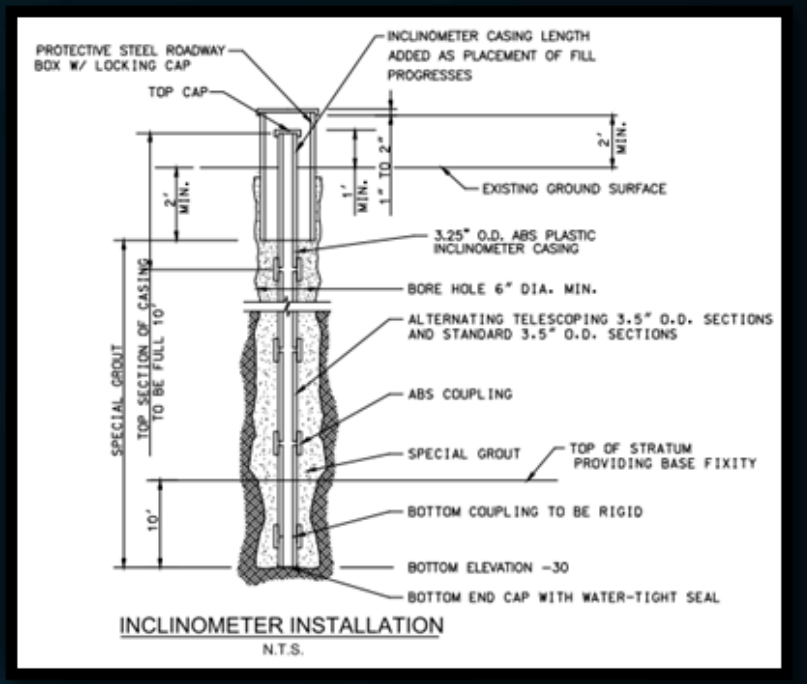
- Excavate existing material and place in stockpile at one end of CDF, inside the existing berms, using geotextile to reinforce.
- Total air capacity for fines: 77,500 cyd (about 59,200 m3)
- Fill the site allowing coarse material to "stack up" further increasing capacity and providing working capacity of 105,000 cyd.

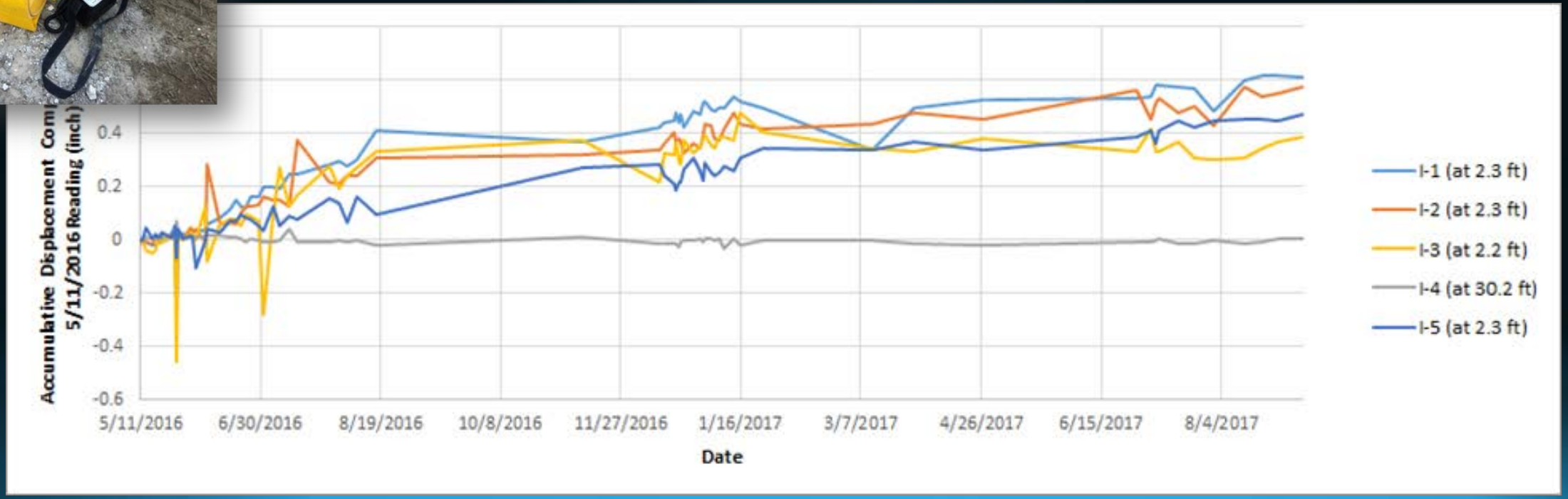




Stability Monitoring

- 5 inclinometers installed
- Monitoring frequency varied
- Results indicated berms remained stable throughout





Wildlife Monitoring

- Timing restriction on dredging from Jan. 1 to June 30 for Anadromous Fish and Winter Flounder.
- Presence/absence survey on Gull Island for Least Tern, American Oyster Catcher and Osprey (April 1-Sept 15). If present, delayed start to Sept. 15 unless no adverse affect to nesting birds.
- Beach placement restricted to Aug. 31 to March 15 – Piping Plover

Creating Capacity on the fly

- Sand recovery from end of CDF nearest inflow pipe
- Placed on top of stockpile
- Generated 9,000 cy (6,800 m3) of additional capacity

Stability Reinforcement

Seepage forces and resultant sloughing of the exterior, southerly berm.

High Performance Turf Reinforcement Mat – Exterior, Southerly Berm for Stabilization

Geomembrane liner system – Interior, Southerly Berm to limit seepage pathways

Cooks Creek

- 5,145 cy (3,933 m3) removed from the State channel
- 1,308 cy (1,055 m3) removed from the USCG berths

“Dog Beach”

9,400 cy (7,175 m3) of >70% sand placed

Long Term Management Strategy

- Accelerated Dewatering
  - Wick Drains
  - Crust Management
- Sampling, Testing, Permitting
- Offloading Facility Design and Construction
- Excavation and Beneficial Use

Questions?