



pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

Compacts and Commissions Office



Exploring the Utility of Sidescan Sonar Imaging for Freshwater Mussel Mapping in the Tidal Delaware River

Water Resources Advisory Committee
March 28, 2019

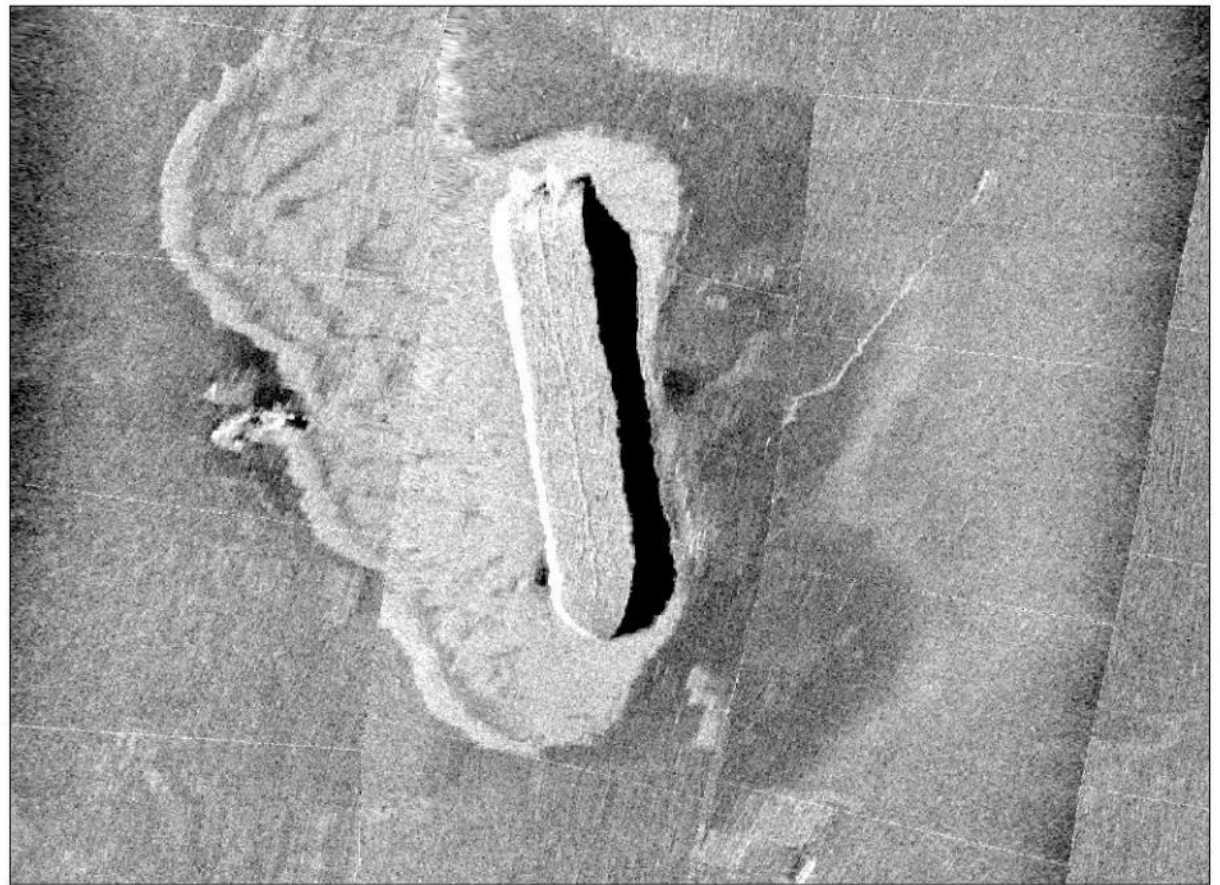
Tom Wolf, Governor

Patrick McDonnell, Secretary

Inspiration

Shipwreck SS Imaging in Lake Erie:

-Howard S. Gerkin



Inspiration

ROV video: Howard S. Gerkin, Stern



Objectives

- Sidescan mosaics for Estuary (PA)
- Determine viability for mussel mapping
 - Drop-camera video verification
 - 4 subjective density categories:
 - None/Sporadic/Common/Bed
 - Produce polygons for GIS

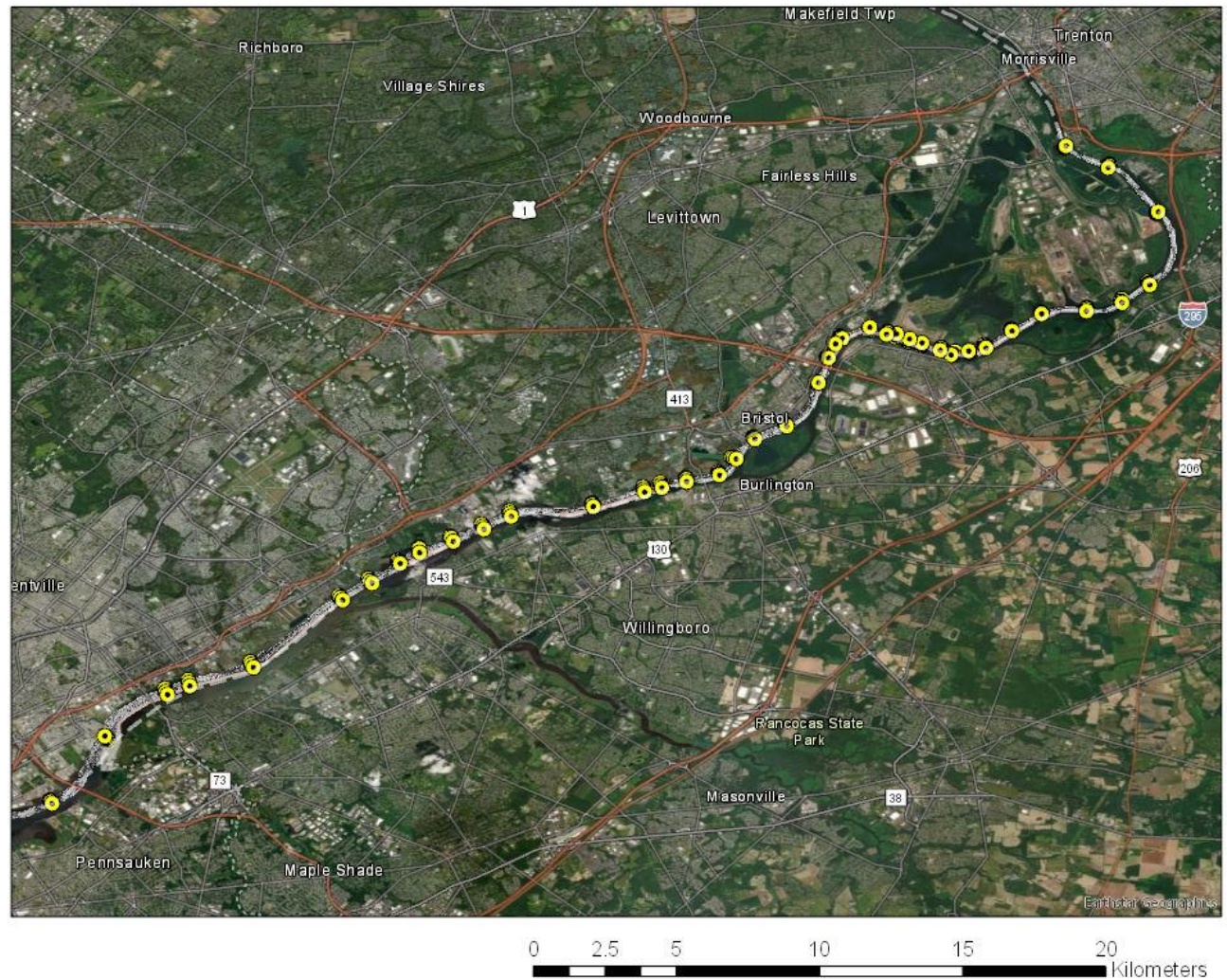
Progress to Date: Sidescan

- Trenton to Little Tinicum Is.
- Tritech Starfish 450F
 - SonarTRX
 - ArcMAP & ArcGIS PRO



Progress to Date: Video

- Trenton to Tioga Marine Terminal
- 165 video sites
- Splashcam
DeltaVision
Industrial HD

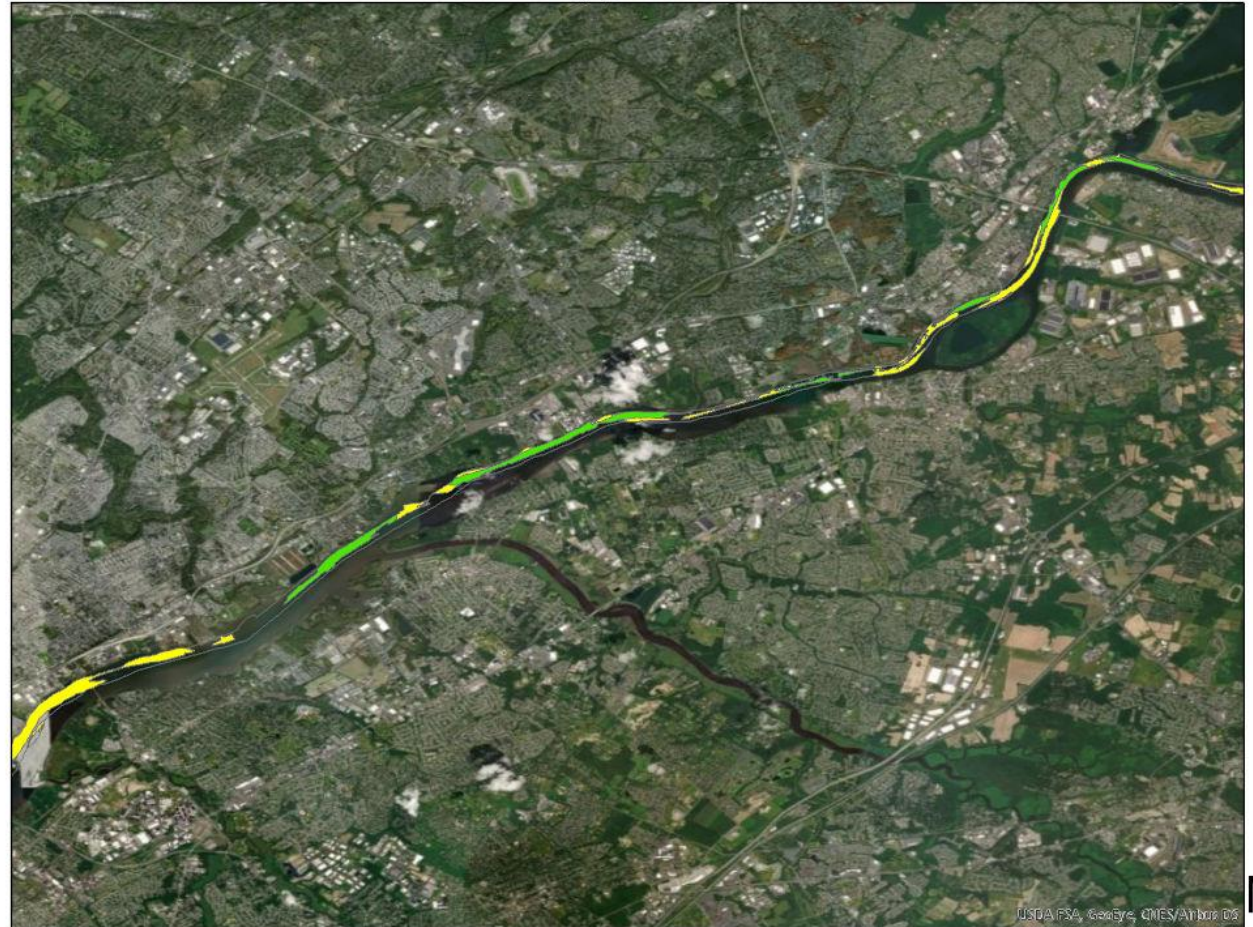


Progress to Date: GIS

Mussel population polygons:

- Trenton to Tioga Marine Terminal
- Categories:
 - None
 - Sporadic
 - Common/Bed
 - Unknown
- 3 Confidence Tiers

Polygons



Martin's Creek/Tullytown



0 5 10 20 30 40 50 Meters



1223b: June 2018



1223c: Bed
with Silt



1223e: June 2018



1223d: Bed
with Silt



Microsoft

0 5 10 20 30 40 50 Meters



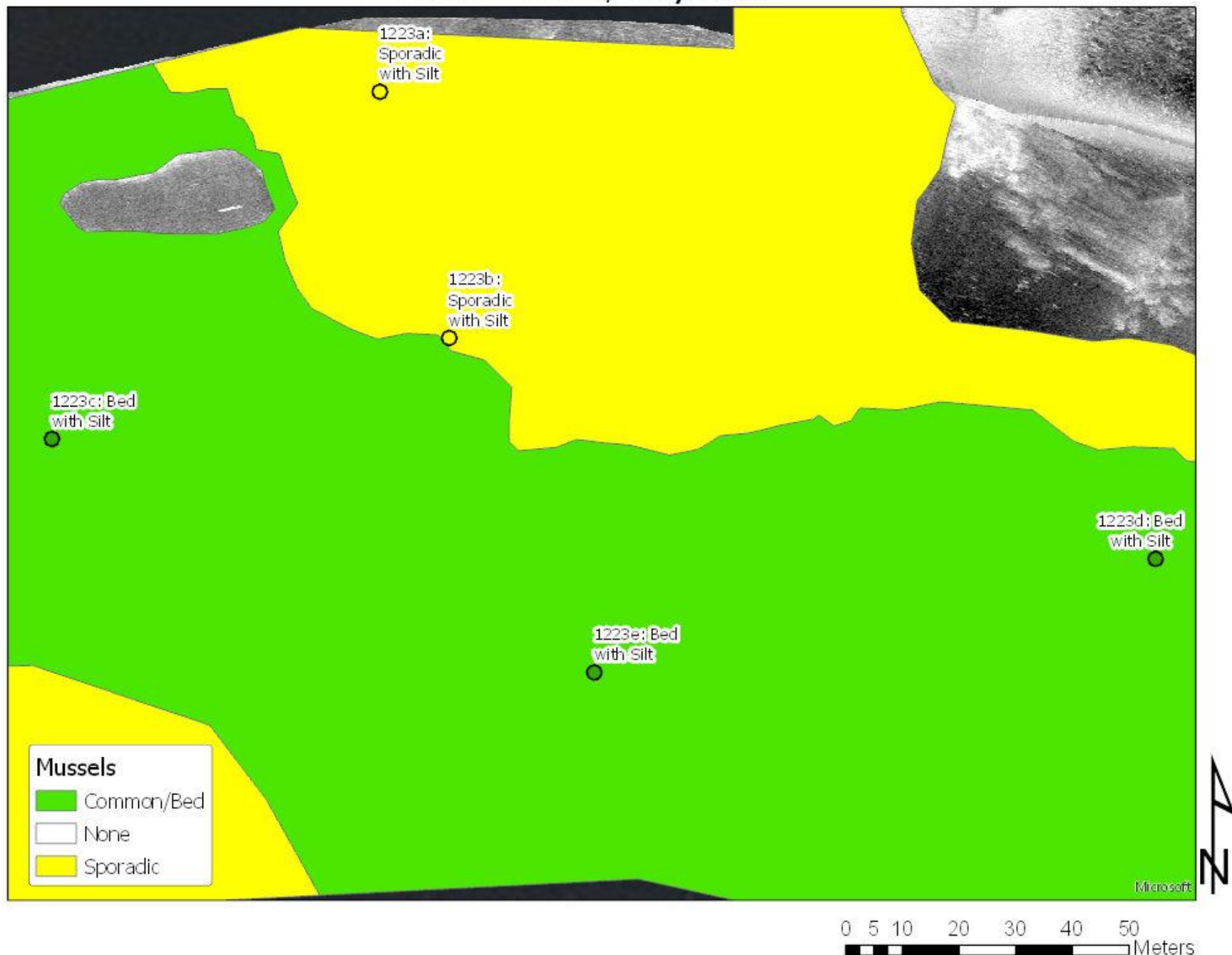
Martin's Creek/Tullytown



0 5 10 20 30 40 50 Meters



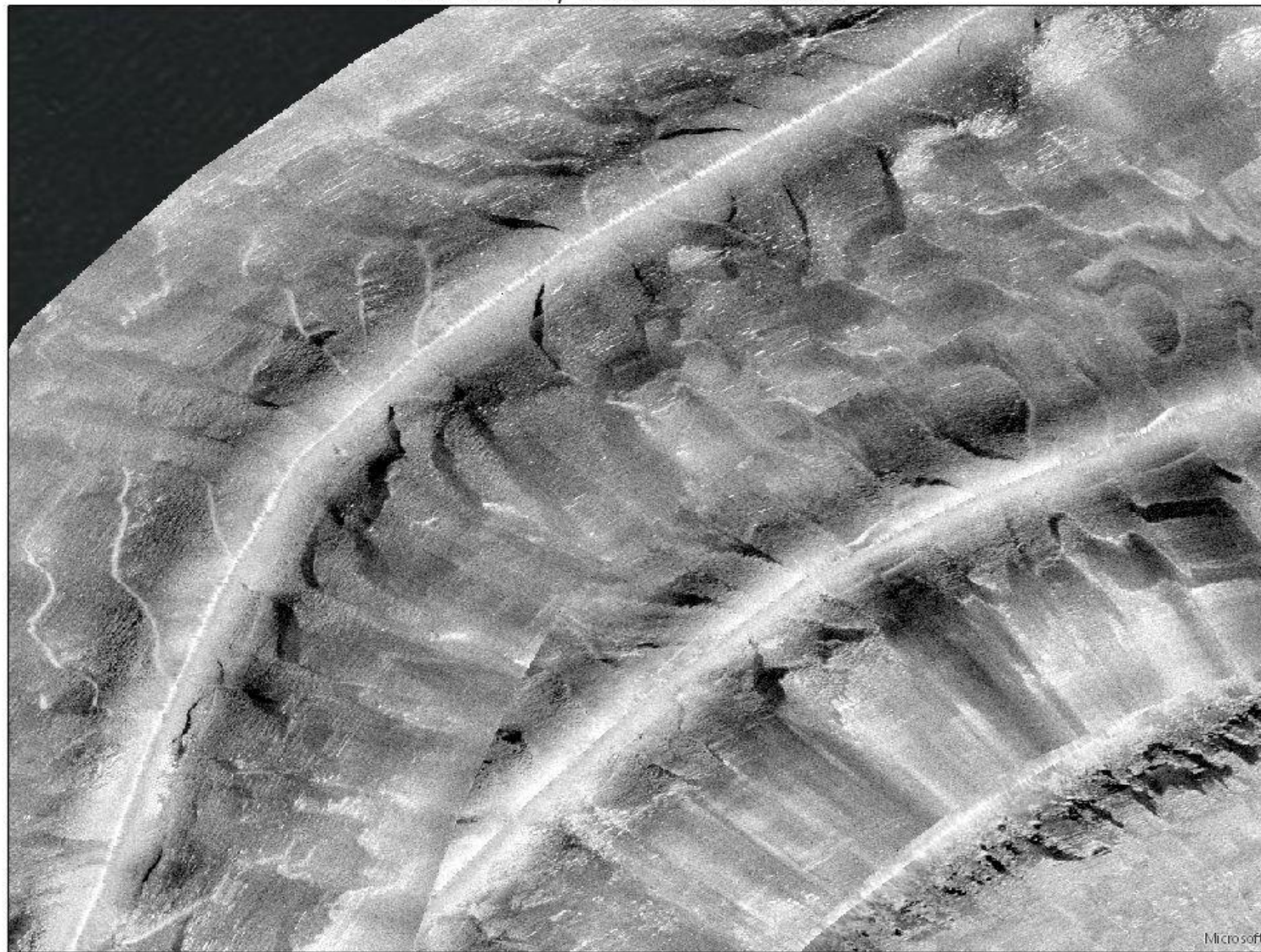
Martin's Creek/Tullytown



Mud Island/Torresdale Manor



Mud Island/Torresdale Manor

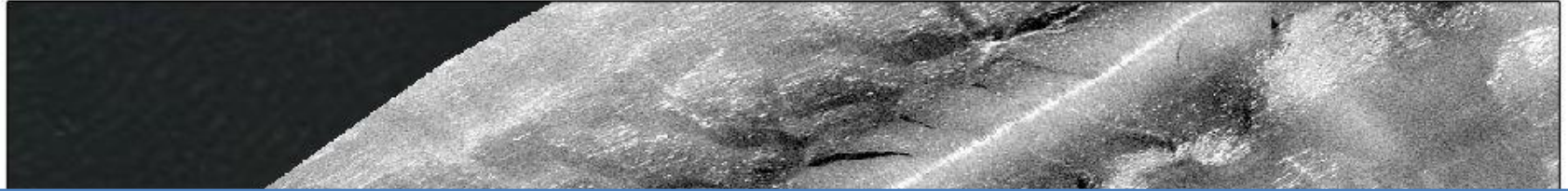


Microsoft



0 5 10 20 30 40
Meters

Mud Island/Torresdale Manor

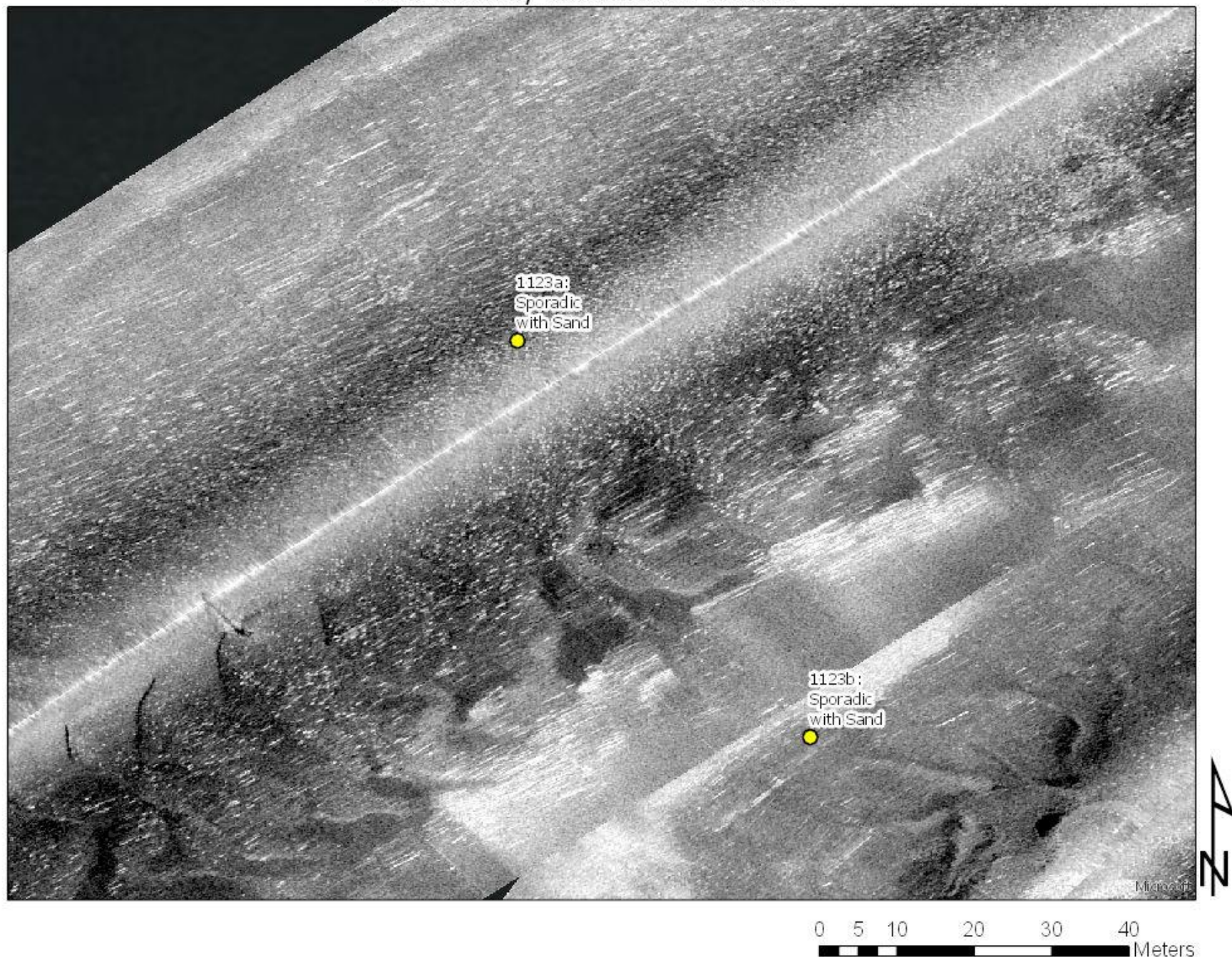


Microsoft

IN

0 5 10 20 30 40
Meters

Mud Island/Torresdale Manor



Mud Island/Torresdale Manor



0 5 10 20 30 40 Meters

Mud Island/Torresdale Manor



Mud Island/Torresdale Manor

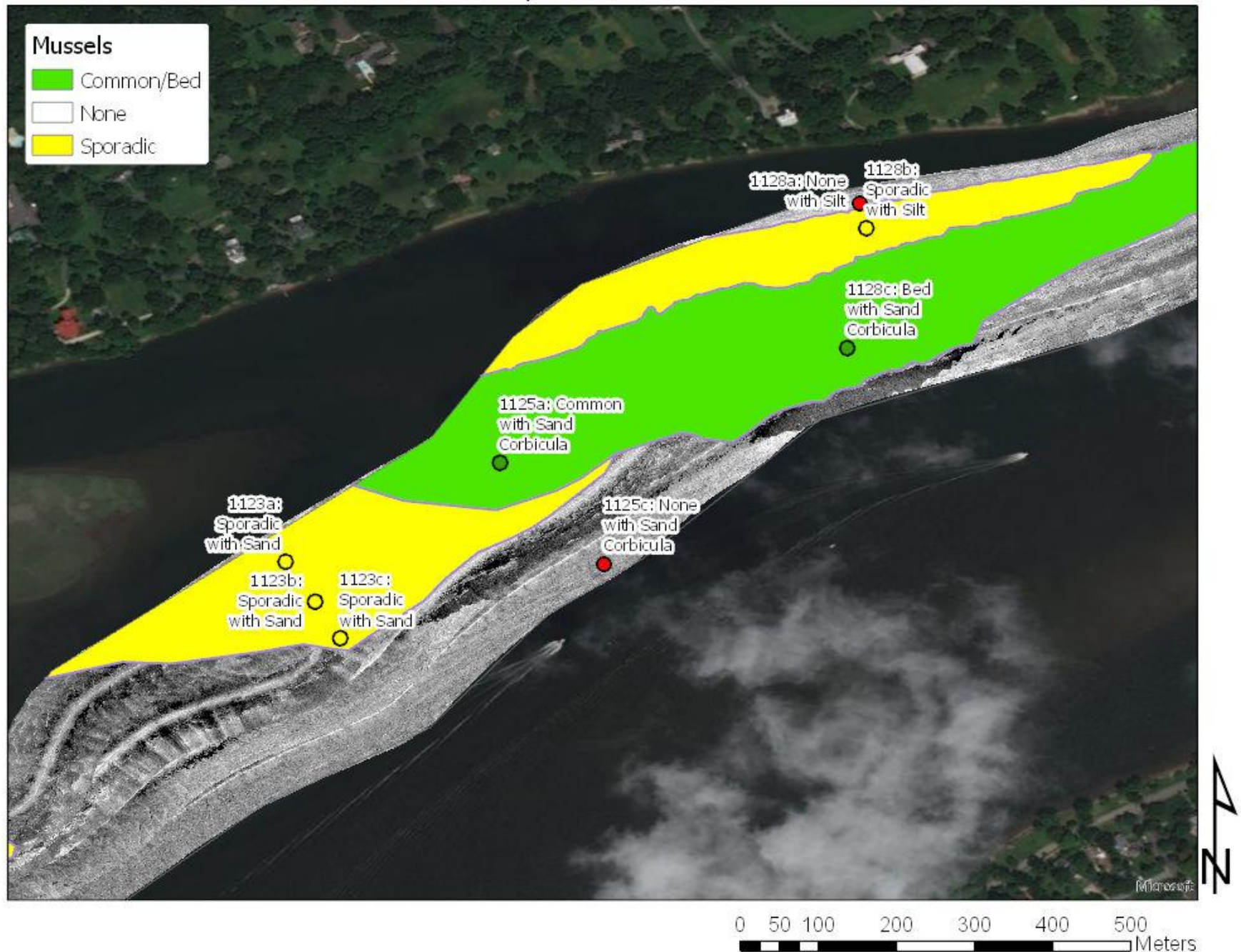


0 5 10 20 30 40 Meters

Mud Island/Torresdale Manor



Mud Island/Torresdale Manor



Tullytown Landfills



1228b: July 2018



1230a: July 2018



Mussels

- Common/Bed
- None
- Sporadic

Tullytown Landfills



Tullytown Landfills



Challenges

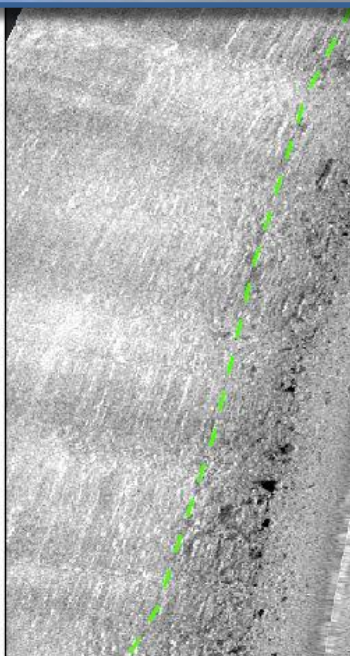
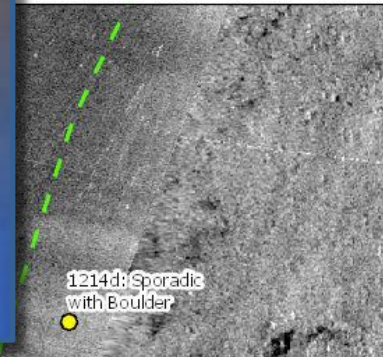
Mussels in Harder Substrates (cobble/boulder):

Upstream of Turnpike Bridge





bble/boulder):



imeters

Challenges

Current and Visibility

- 1227d: Tullytown Landfills



False Negatives

Conclusions

- Sidescan imagery can be an effective screening and mapping tool, but primarily in soft sediments.
- Ground-truthing is vital to accurate interpretation of acoustic data, especially in hard substrates.

Next Steps

- Complete sidescan and video collection
- Finalize polygons

Survey Plan





pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION



Compacts and Commissions Office

Thank you!
Matt Walderon
mwalderon@pa.gov



pennsylvania
COASTAL RESOURCES MANAGEMENT



pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION