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

Water Resources Advisory Committee
March 28, 2019
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
Mussel population polygons:

- Trenton to Tioga Marine Terminal

Categories:
- None
- Sporadic
- Common/Bed
- Unknown

3 Confidence Tiers

Progress to Date: GIS
Mud Island/Torresdale Manor

1123a: Sporadic with Sand
1123b: Sporadic with Sand
1123c: Sporadic with Sand
1125a: Common with Sand Corbicula
Mud Island/Torresdale Manor

Mussels
- Green: Common/Bed
- White: None
- Yellow: Sporadic

Legend:
- Common with Sand Corbula
- Sporadic with Sand
- Sporadic with Silt

Map showing the distribution of mussels with different conditions across Mud Island/Torresdale Manor.
Tullytown Landfills
Challenges

Mussels in Harder Substrates (cobble/boulder):

Upstream of Tumpike Bridge
Mussels in Harder Substrates (cobble/boulder):

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
Thank you!
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