



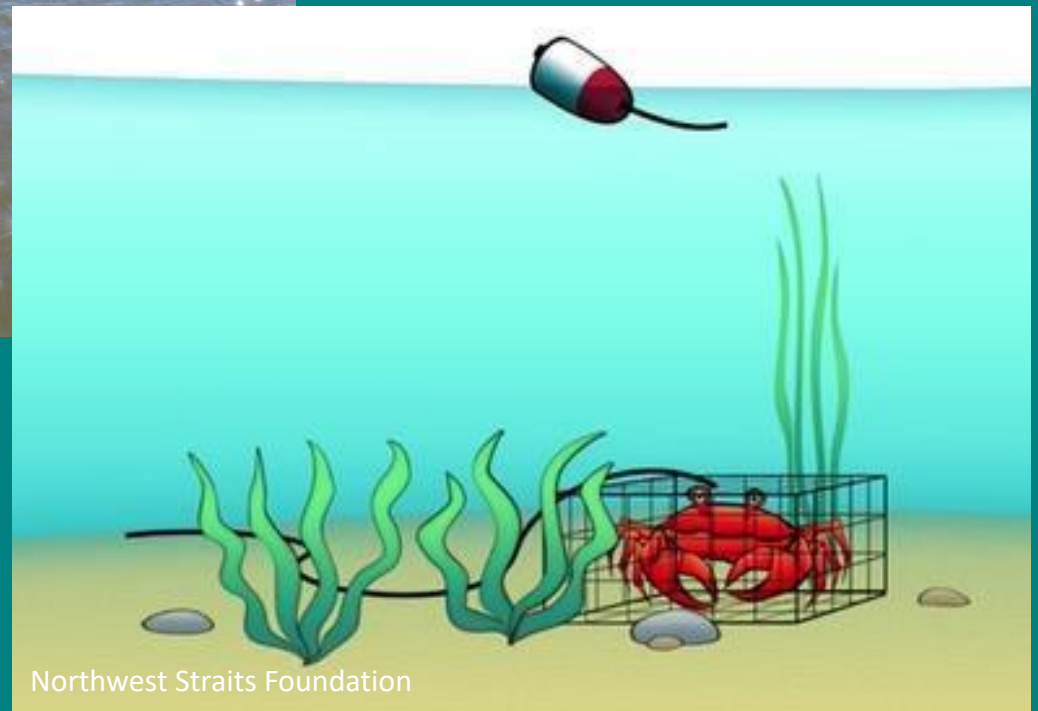
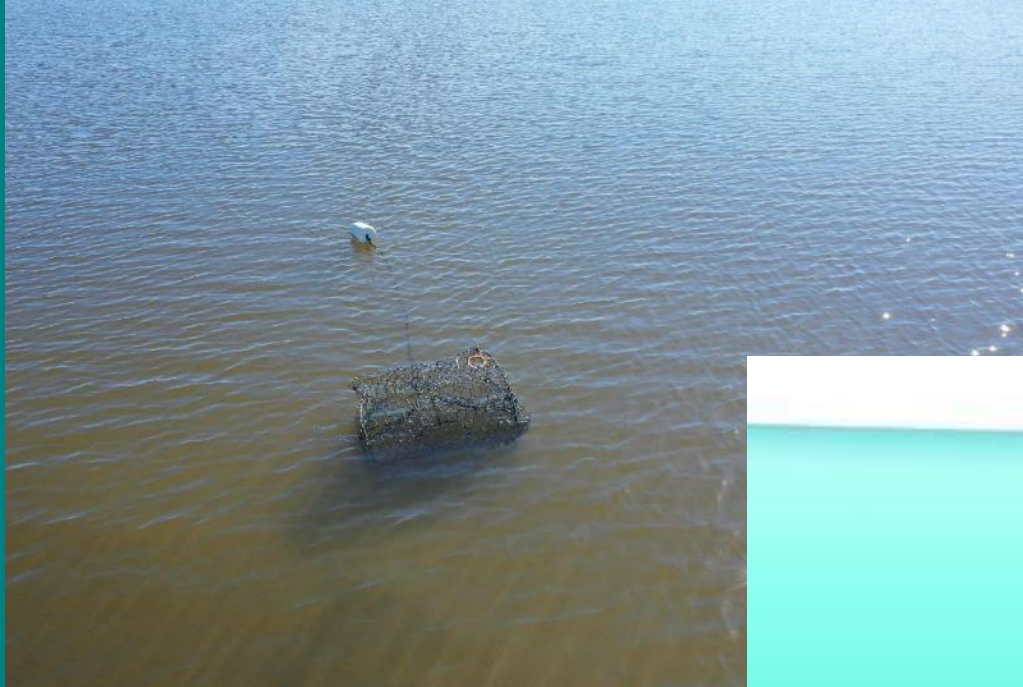
# Search for the unseen: Are derelict crab pots prevalent in Delaware's Inland Bays?

Kate Fleming  
Coastal Ecology Specialist  
Delaware Sea Grant

Art Trembanis, PhD  
CSHEL Laboratory  
University of Delaware



# Derelict Crab Pots





# Implications



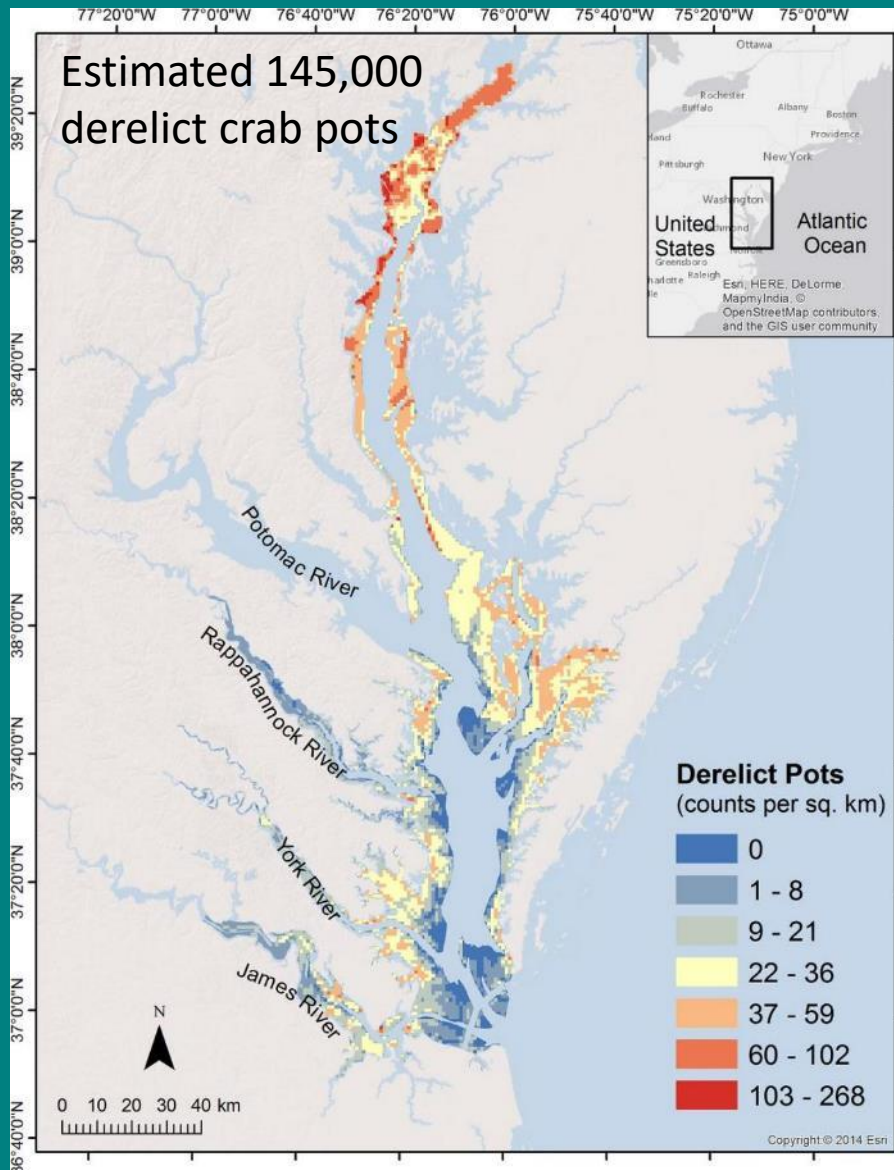
- Ghost Fishing
  - Blue Crabs: Starvation, cannibalism, infection, disease, exposure to poor water quality
  - Terrapins: Drowning



- Navigation Hazard
- Habitat scouring



# A Common Coastal Problem



- NC: recovered 35,000 (since 2003)
- LA: recovered 37,000 (since 2004)
- DE Bay: 500 detected off Woodland Beach



# Delaware Inland Bays?

- Recreational Blue Crab Fishery





# Curtailing Pot Abandonment





# Directed Effort: CIB Winter 2012

- Volunteer-based recovery of ~70 pots
- Opportunistically located through visual surveys
- No data collected





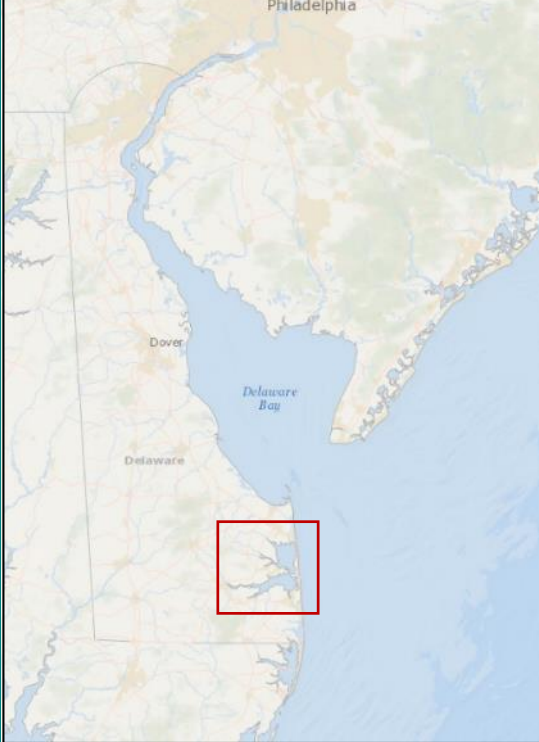
# CIB Summer Clean-Ups











Interviews with:  
DNREC-DFW (Enforcement, blue crab biologist),  
Recreational Crabber, Center for Inland Bays



# Search for submerged Derelict crab pots



**R/V Dogfish**

**Humminbird Solix Mega SI: 1200 kHz**

**Effective swath: 50 ft. in 2 ft. of water**



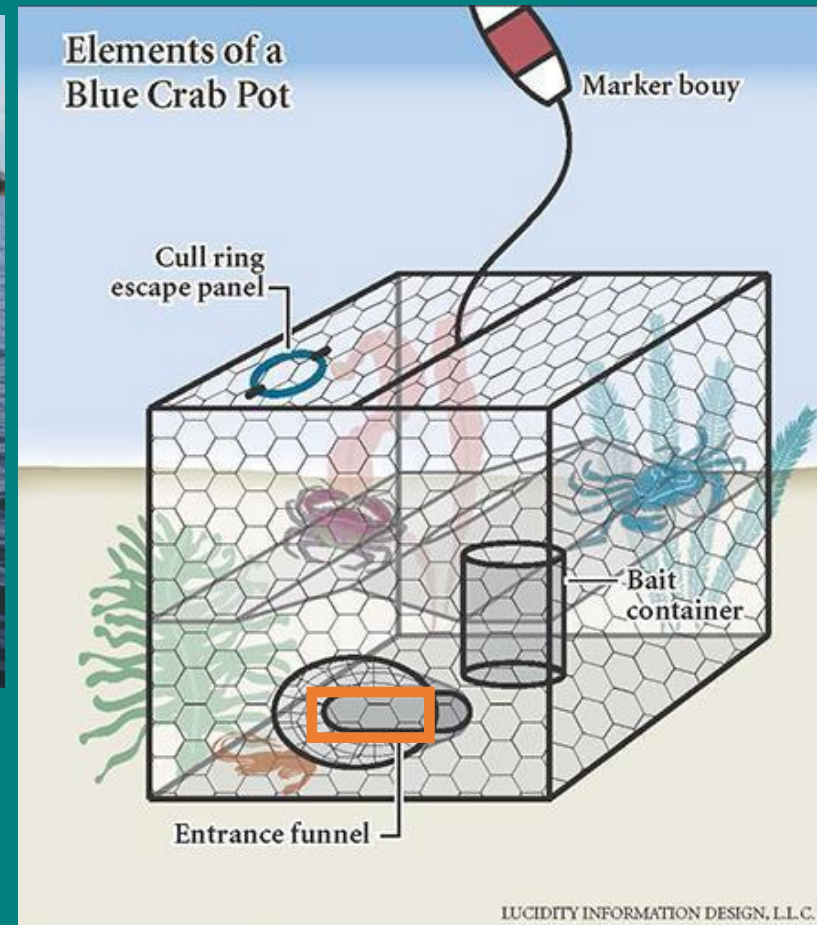




# Ground-truthing



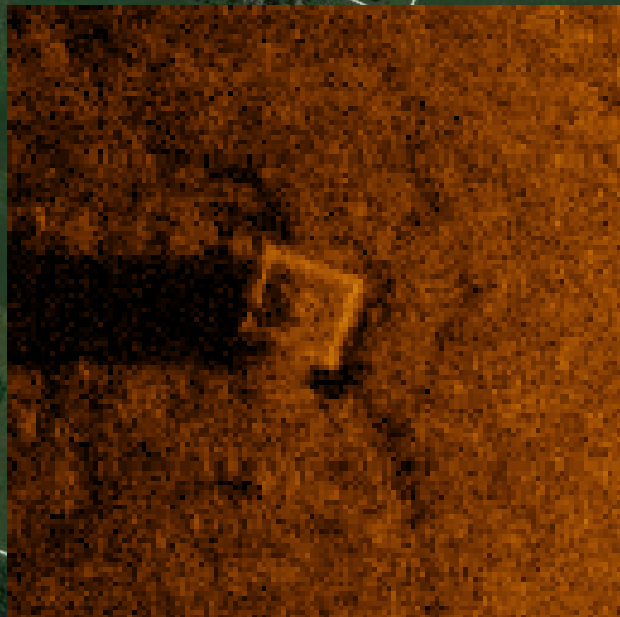
Assessed bycatch present  
Pot status





# Love Creek

## 26 Pots





# Herring & Guinea Creek

56 Pots





# Bay Cove

78 Pots

74 Pots in 21 acres  
3.5 pots/acre



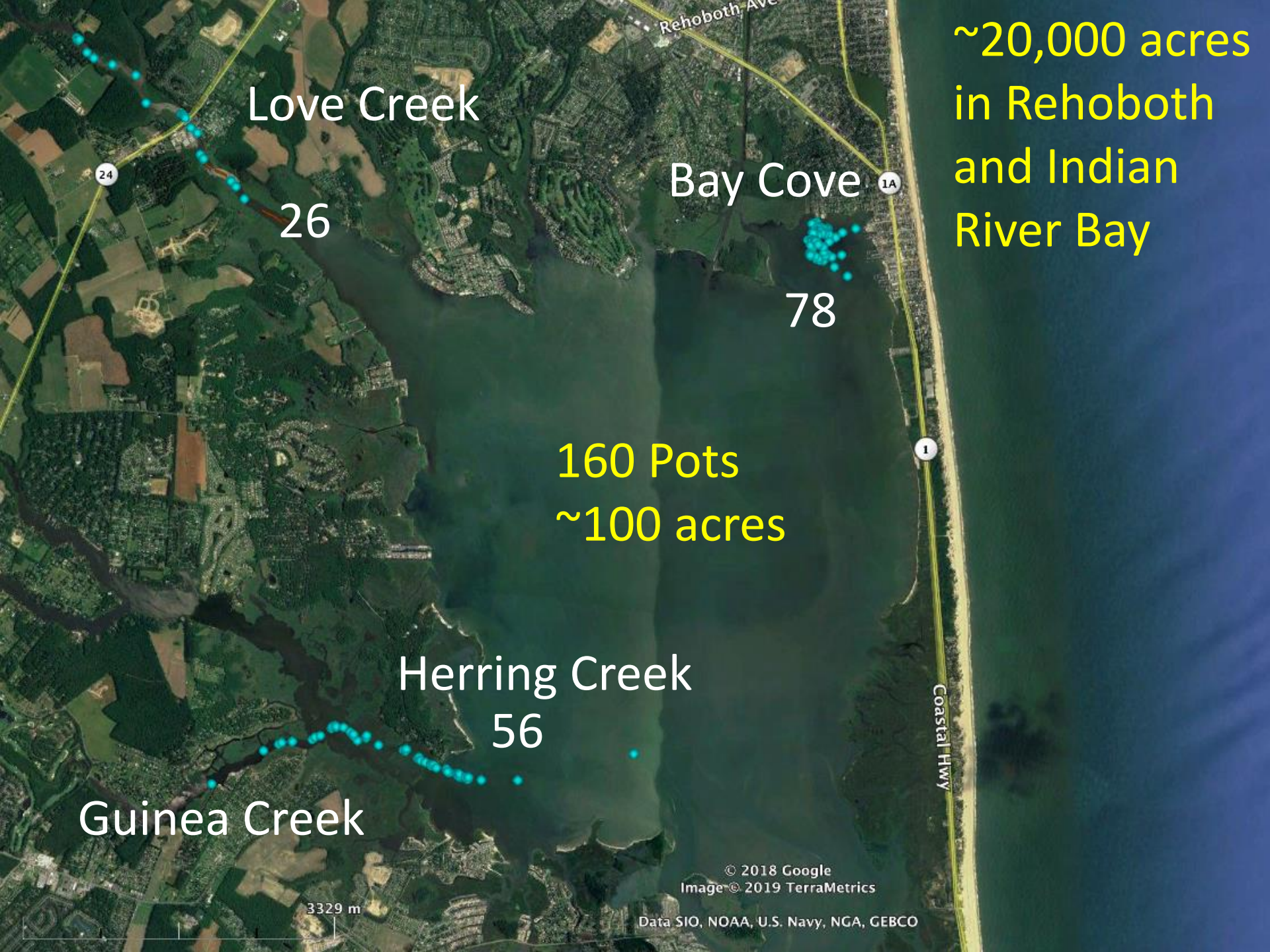
© 2018 Google

Goog

144 m







Love Creek

26

Bay Cove

78

160 Pots  
~100 acres

Herring Creek

56

Guinea Creek

~20,000 acres  
in Rehoboth  
and Indian  
River Bay

3329 m

© 2018 Google  
Image © 2019 TerraMetrics

Data SIO, NOAA, U.S. Navy, NGA, GEBCO



# Ground-Truth Results



Hauled 6 derelict crab pots



# Bycatch

## Deceased

	# of Pots	Individuals
Blue Crabs	3	5
Sunfish	1	1
Total Deceased bycatch	3	6



## Live

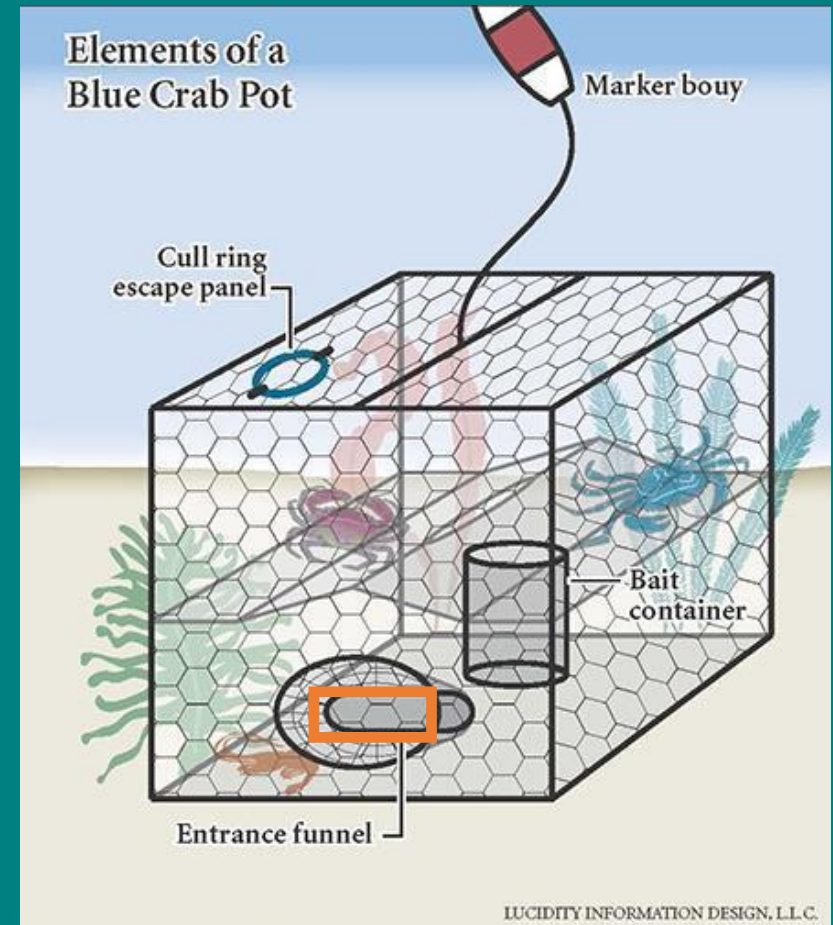
Species	# of Pots	Individuals
Blue Crabs	1	2
Largemouth bass	1	1
Oyster toadfish	3	5
Total Live Bycatch	5	12



Additional buoyed pot with 8 blue crabs



# Pot Status



- Cull rings: 1/6
- Bycatch Reduction Device: 1/6
- Biodegradable escape panels: 0/6



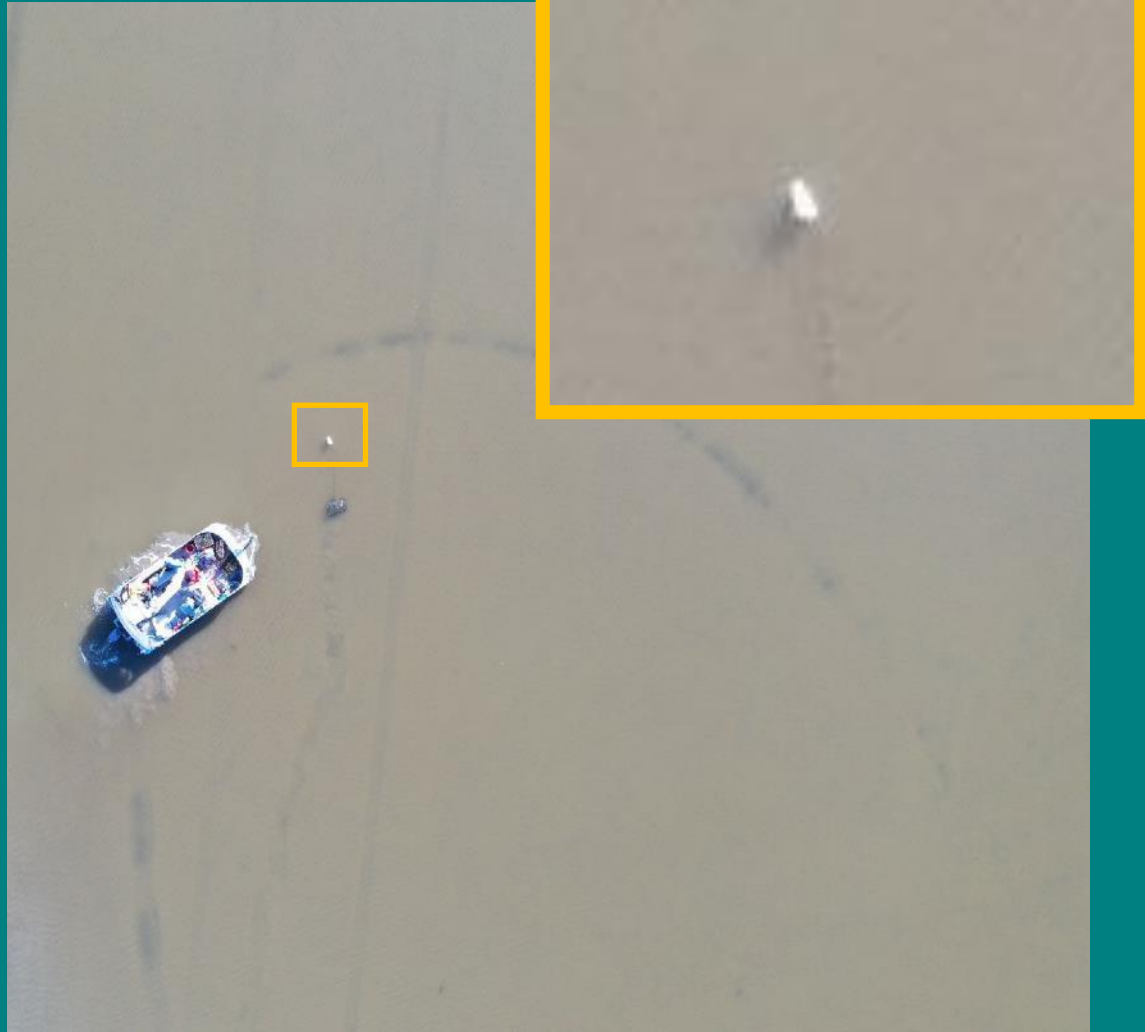
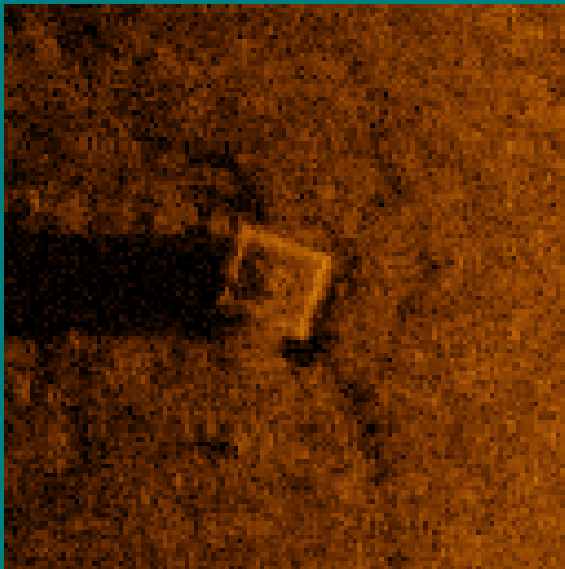
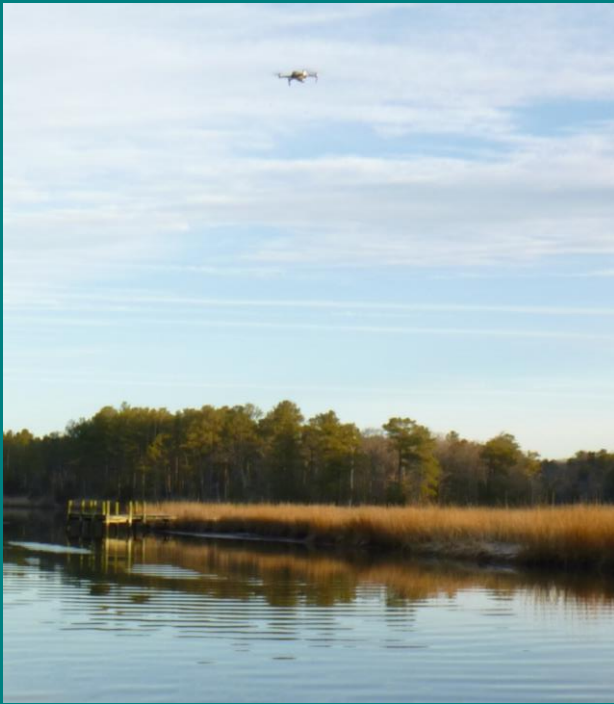
# Conclusions

- Potential for ~38,000 derelict crab pots in Rehoboth & Indian River Bays, associated creeks
- Solix mounted to pontoon works well in 0.5 -1.5 m waters
- Sonar combined with grappling hooks worked well
- Drones did not work well to document submerged pots
- BRD Compliance issue?





# Future Work: Recreational Crabbing Effort





# Future Work: Comprehensive Assessment

- Side-scan sonar surveys
  - Assess distribution and abundance of derelict pots
  - Replacement and accumulation rates
- Removal
  - Diversity and abundance of marine fauna
  - Assess Bycatch Reduction Device compliance





# Future Work: Outreach and Extension

- Reduce overall pot loss
- Minimize impact of lost pots



Virginia Sea Grant



# Future Work: Coordination



Center for Inland Bays



# Acknowledgements



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# Thanks and Questions?

Kate Fleming  
kfleming@udel.edu  
302-645-4297

