



Towed-diver Derelict Spiny Lobster Trap Debris Surveys in Florida Keys National Marine Sanctuary

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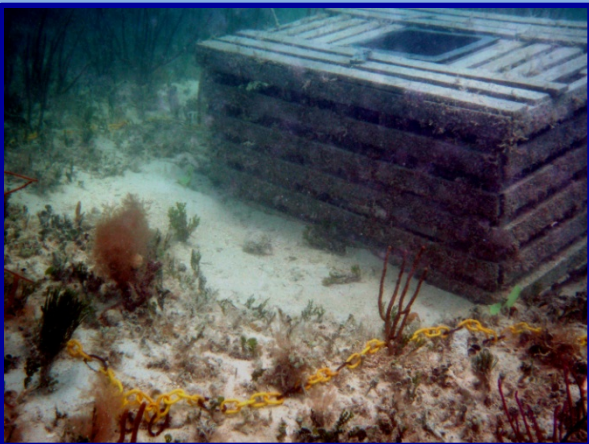
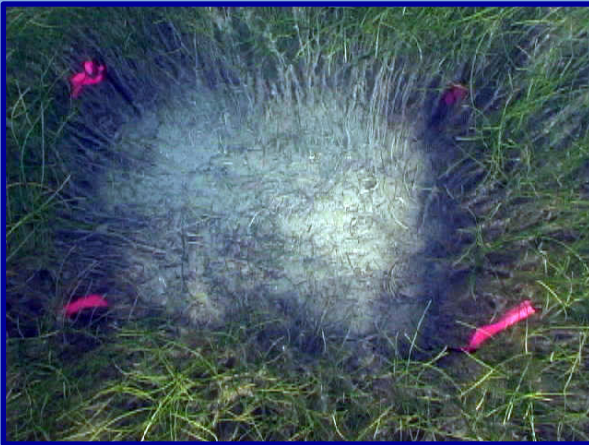


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THE ISSUES

- Substantial number of traps in use
- Trap loss is a reality
- Long-term deployment and wind-driven trap movement damages habitat
- < 5% derelict traps retrieved annually



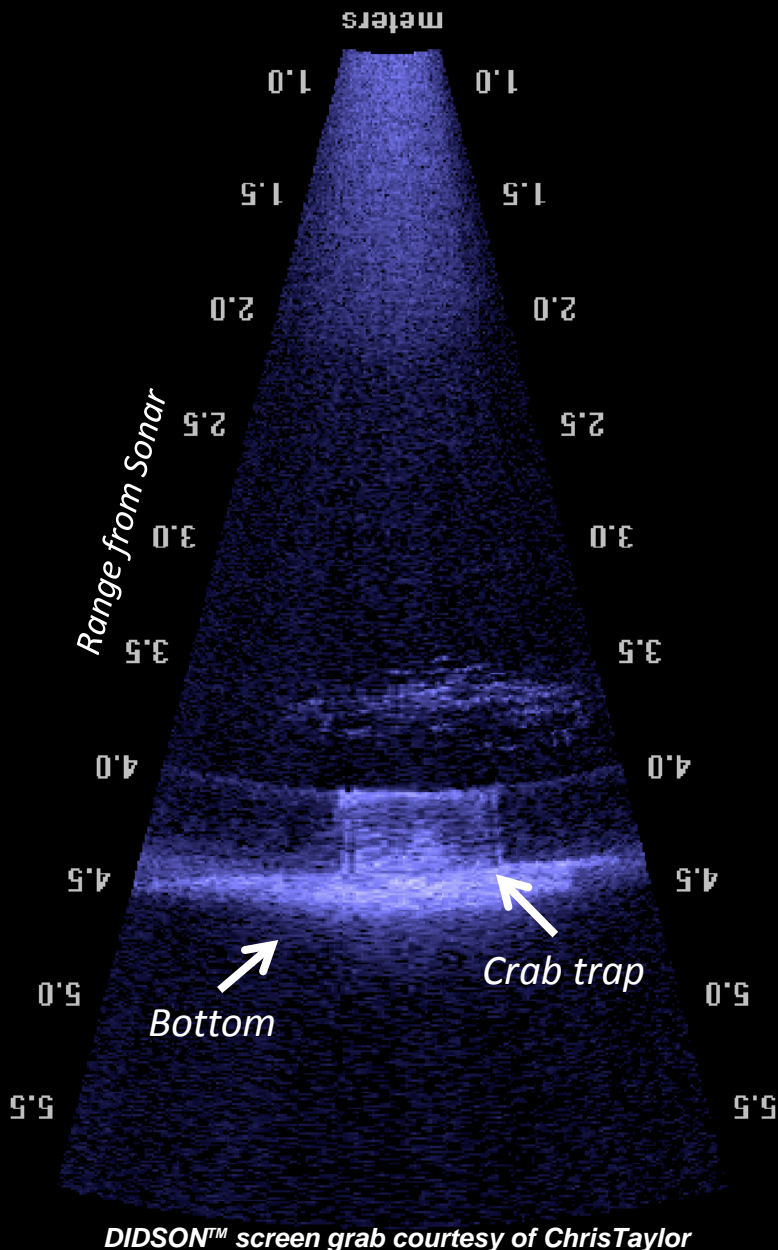


RESEARCH QUESTIONS

- Abundance, condition, and spatial distribution of trap debris
- Distribution as function of habitat type and fishing effort

WHY TOWED-DIVER SURVEYS?

- Sonar requires high contrast between target and habitat (i.e., hard edges)
- Eyes in the water allow:
 - ✓ identify small debris items
 - ✓ habitat groundtruthing
 - ✓ perceptions of pattern





WHY TOWED-DIVER SURVEYS?

- More coverage than fixed transects
- Effective method used elsewhere
- Because it's fun!

SURVEY METHODOLOGY

Location = random point

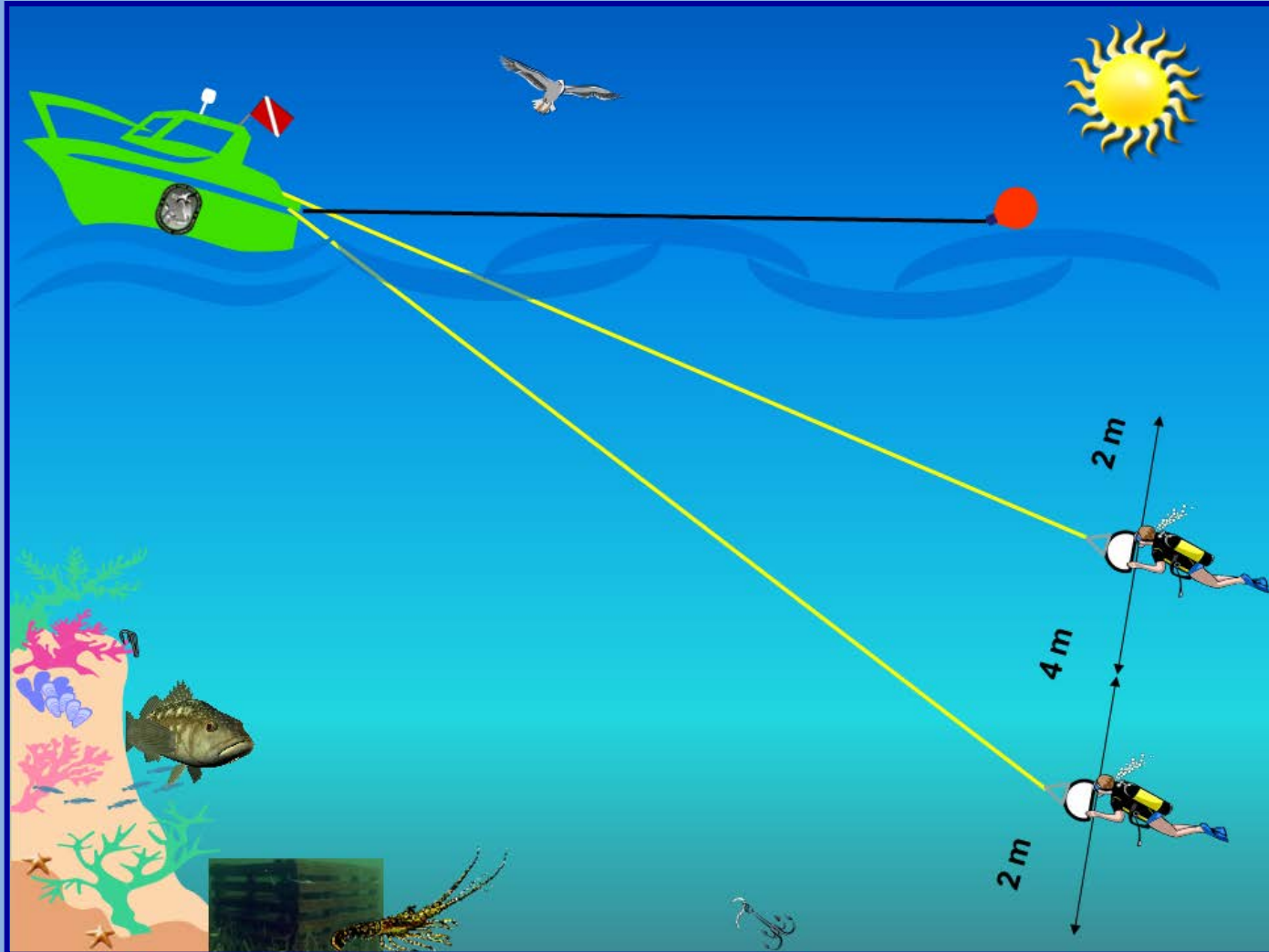
Distance = 1 kilometer

Depth = 1 - 15 meters

Direction = random bearing

Speed = 1.6 knots

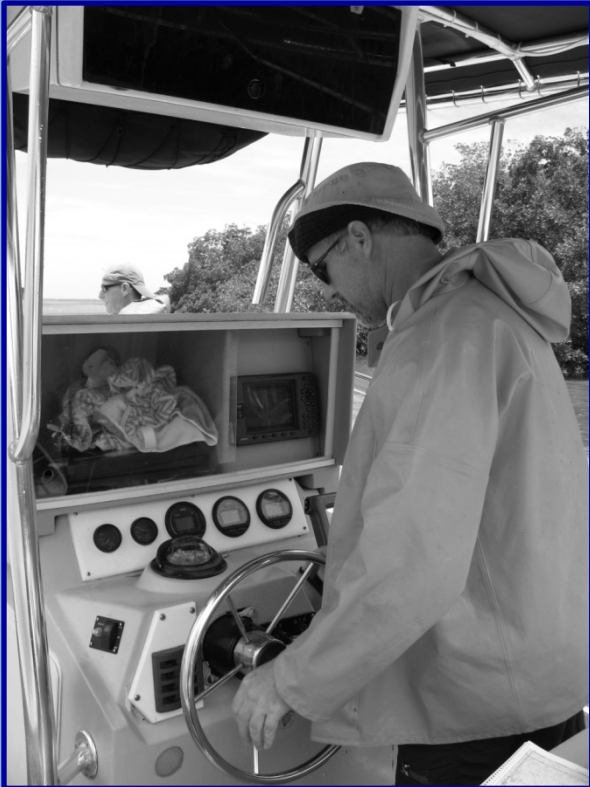
Duration = 14 - 28 minutes



DATA COLLECTION

Topside

- Tow duration
- **Garmin GPSMAP® 3206**
Start / Stop coordinate
Tow track
- Post-tow data transcription





DATA COLLECTION Divers

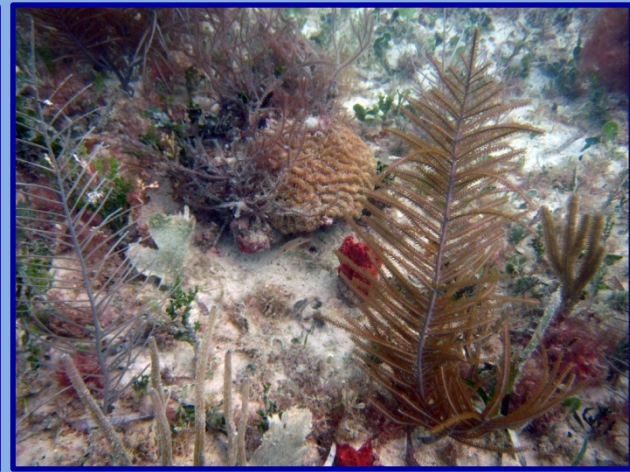
- Tow duration
- Habitat @ 1-min intervals
- Individual debris items
- Habitat associated with debris



BARE

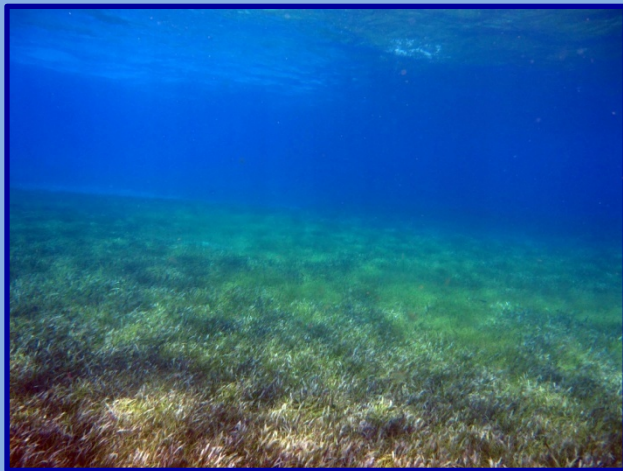


ALGAE



HARDBOTTOM

HABITAT CLASSIFICATION



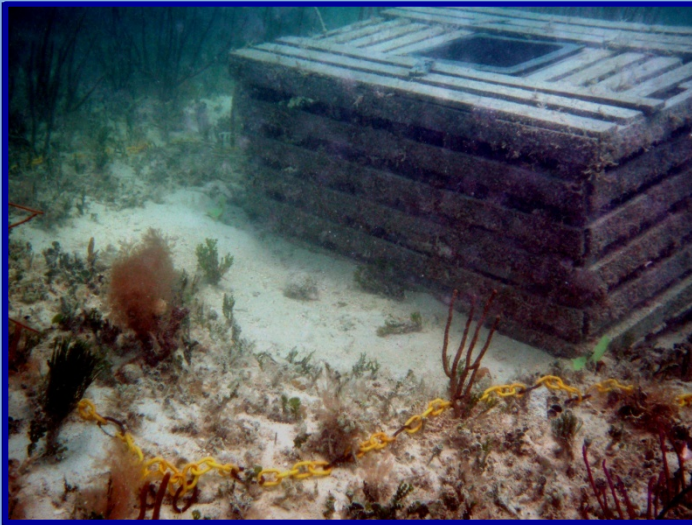
SEAGRASS



CORAL

TRAP DEBRIS CLASSIFICATION

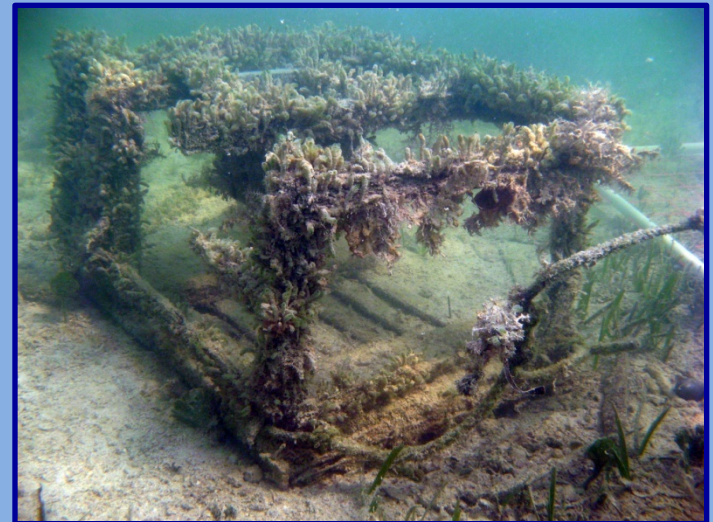
WOOD LOBSTER TRAP



PLASTIC CRAB TRAP

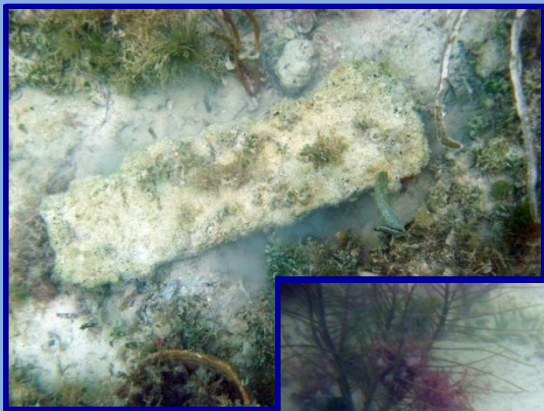


WOOD LOBSTER FRAME



**WIRE
LOBSTER
FRAME**





**CEMENT
SLAB**



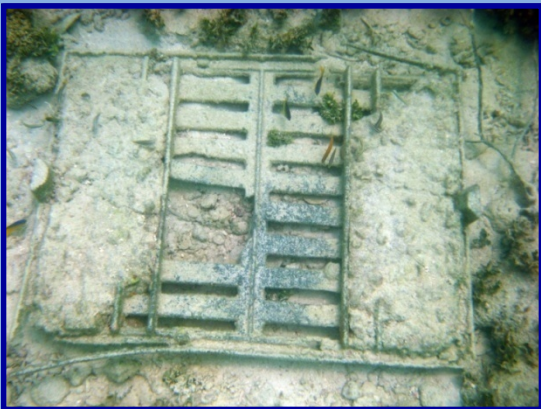
ROPE



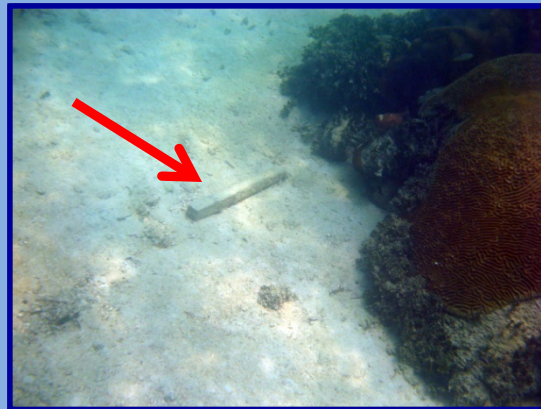
**PLASTIC
THROAT / LID**



WOOD SLAT



INTACT BOTTOM

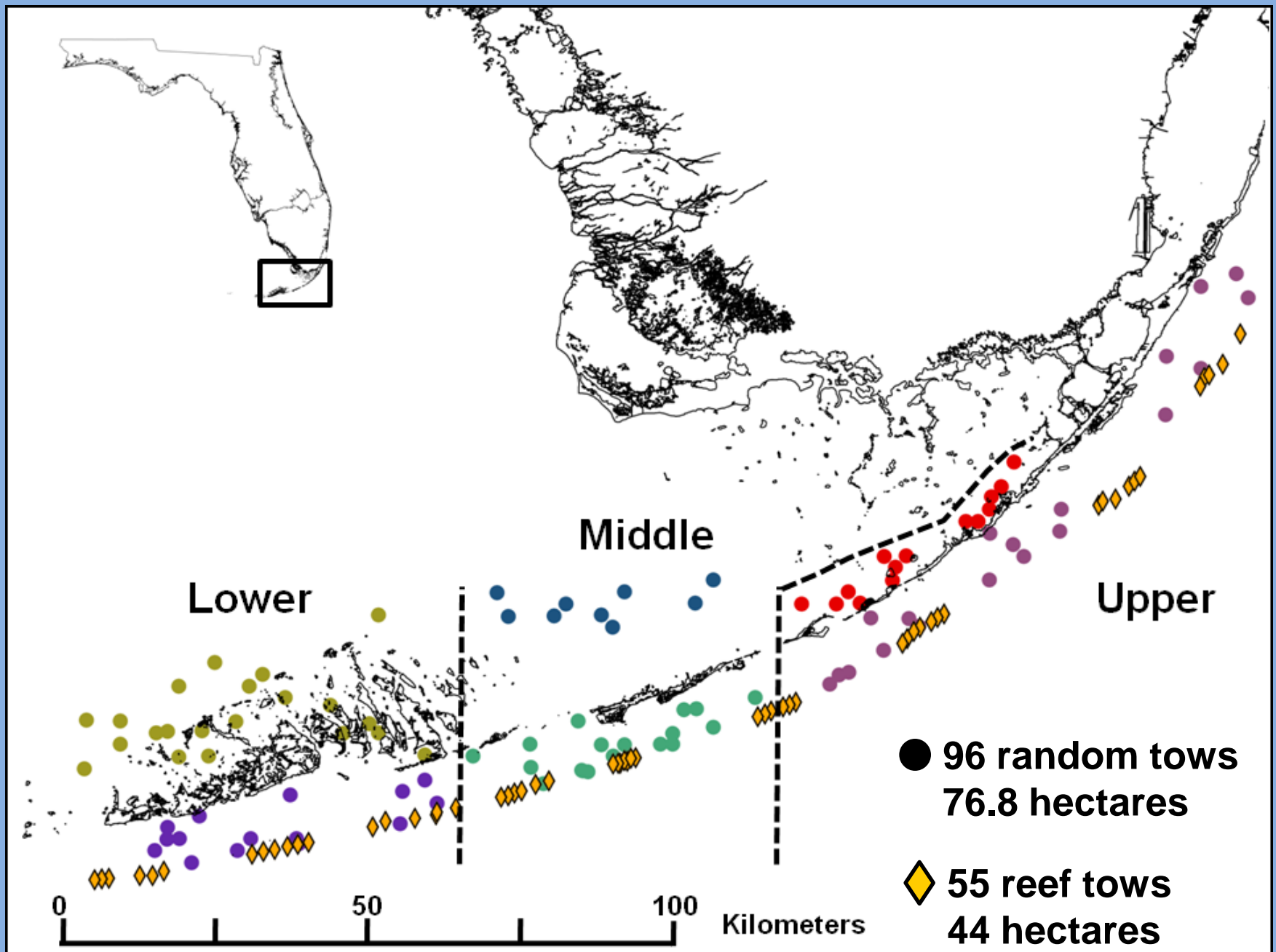


WIRE SIDE





SURVEY LOCATIONS





OUTCOMES

- 75% of all debris trap-related
- See poster!

ADVANTAGES

- Greater survey coverage versus fixed, swimming transect
- Inexpensive startup, minimal equipment
- Ability to effectively survey shallow water (< 15 m)
- Can multi-task/overlap surveys
- Eyes in the water allow:
 - ✓ ID of actively fishing traps
 - ✓ ID of small debris items
 - ✓ habitat characterization
 - ✓ perception of patterns

DISADVANTAGES

- May overlook debris in crevices versus fixed, swimming transect
- Potential hazards for divers
- Inability to effectively mark traps “on-the-fly” for relocation
- Increased effort, reduced survey coverage vs. sonar or AUV
- Ability to conduct tows dependent upon visibility, sea state, current speed, & boat traffic

ACKNOWLEDGMENTS

Team
Shark Bait! Hoo ha ha!



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Fifth International Marine Debris Conference

Waves of Change: Global lessons to inspire local action



Priority Actions

Actions to reduce marine debris from 2011-2021:

- Targeted surveys to improve removal efficiency
- Continued trap reductions in the fishery
- Alter fishery fee structure to charge for lost traps

