

New Equipment Demo Project: Turtle Tickler Chains and Acoustic Camera on the Essayons

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Outline

- Background on turtles, hopper dredges, and ticklers
- Demonstration objectives
- Monitoring equipment
- Results
- Way forward





**FROM
THE JAWS
OF
DEATH**

**Sports
Illustrated**

1981

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Documented Takes by Dredges

748

Sea Turtles

1980-2012

(33 years)



Inflow screening



Overflow screening



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<http://dqm.usace.army.mil/odess/#/home>

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Turtle Protection Methods

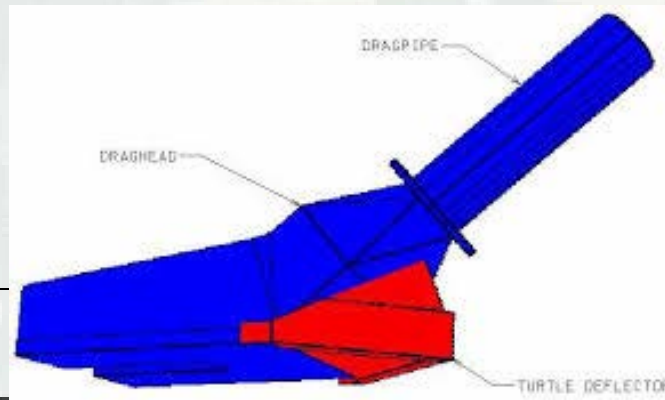
1. Environmental windows
3. Slow pumps in water column
4. “Capture” trawling to relocate turtles
5. “Non-capture” trawling to move turtles
6. Draghead turtle deflector
7. Water-injection dredging (foreign use)
8. Tickler chains (previously only foreign use)



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Evolution of Deflector Designs



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Turtle Tickler Chains (TTC)



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Tickler Chain Terminology

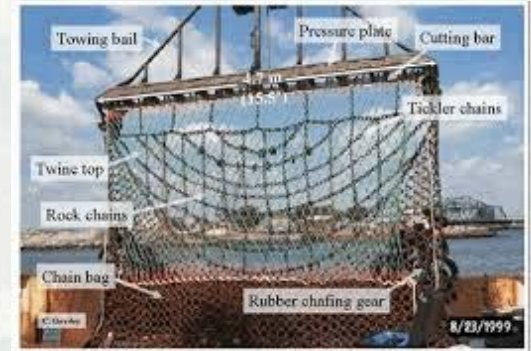
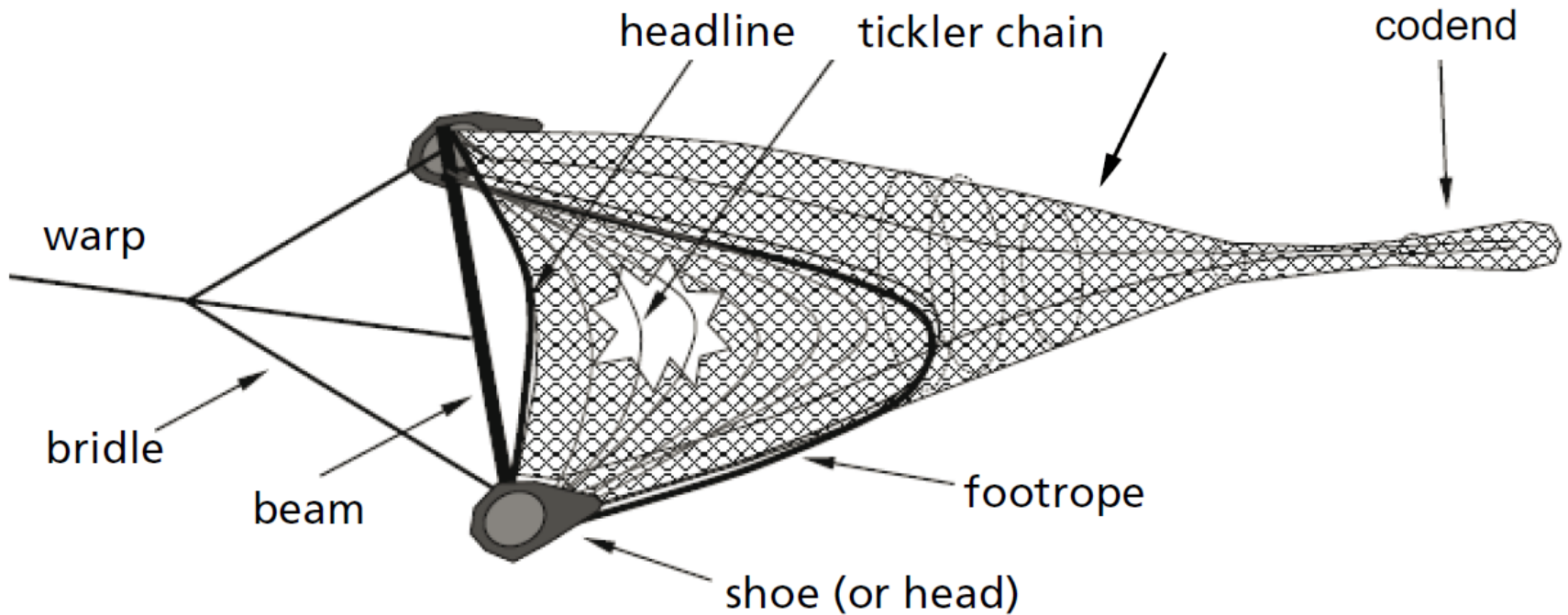


Figure 1. A typical New Bedford scallop dredge (1)

Beam trawl



TTC Demonstration



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**Strategic Objective:
Replace turtle deflectors with TTC**

Demonstration Evaluation Objectives

Tickler Chains – do they:

- maintain contact with bottom?
- entangle to form drowning risk?

Turtle Deflector – does it:

- maintain contact with bottom?
- form a required sediment wave?

Camera Systems

- turbidity impacts on visual systems?
- acoustic camera – does it work at all?



Monitoring Equipment



GoPro Cameras

High-def
Diver Camera

Acoustic Camera



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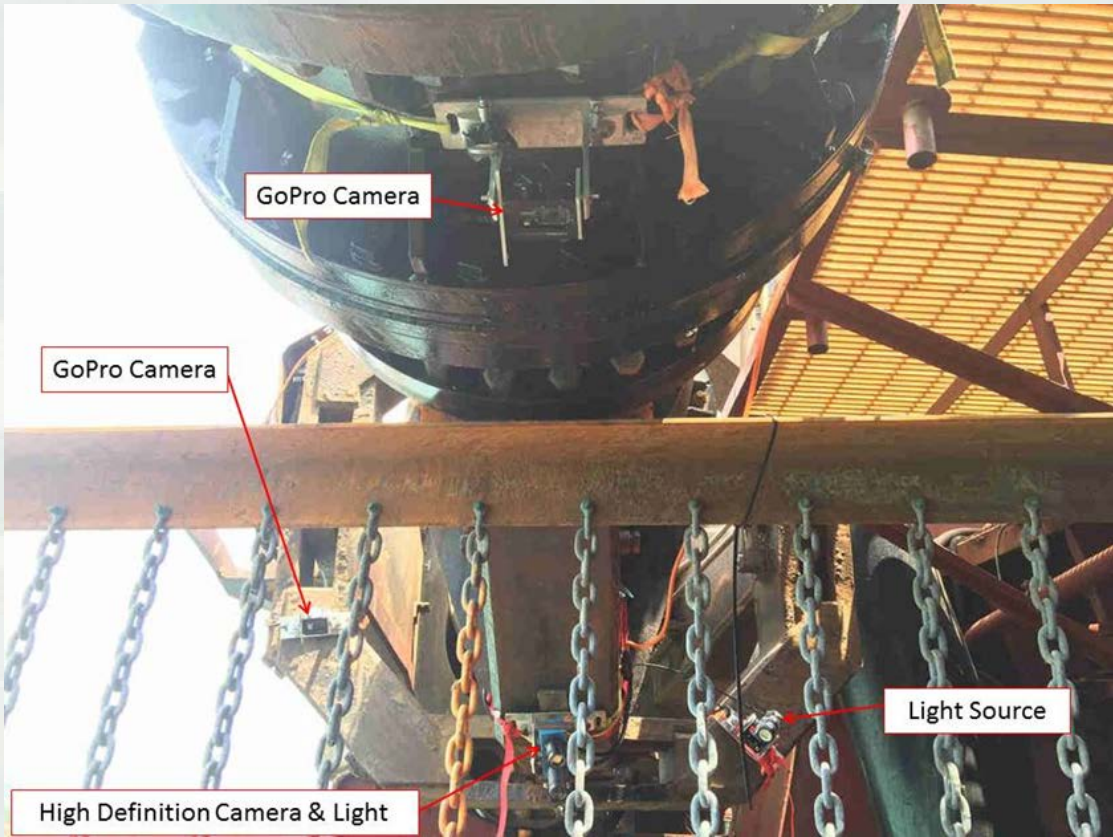
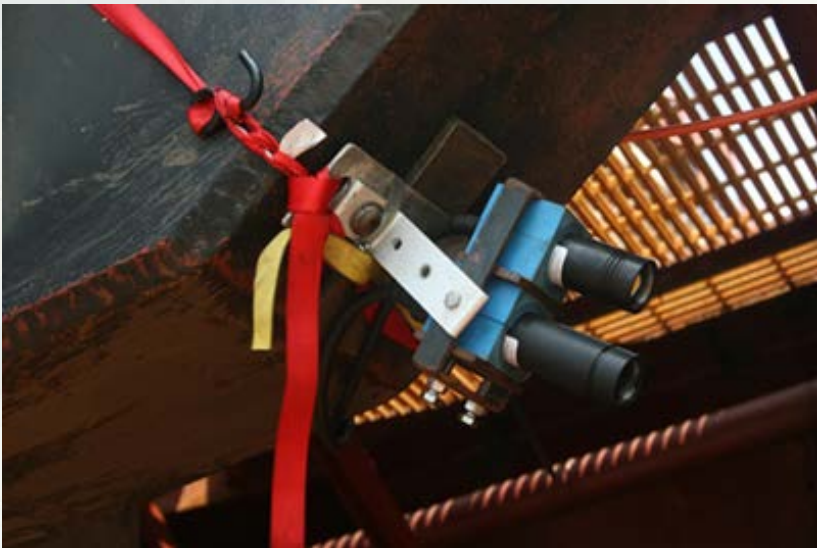


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Camera Mount Construction

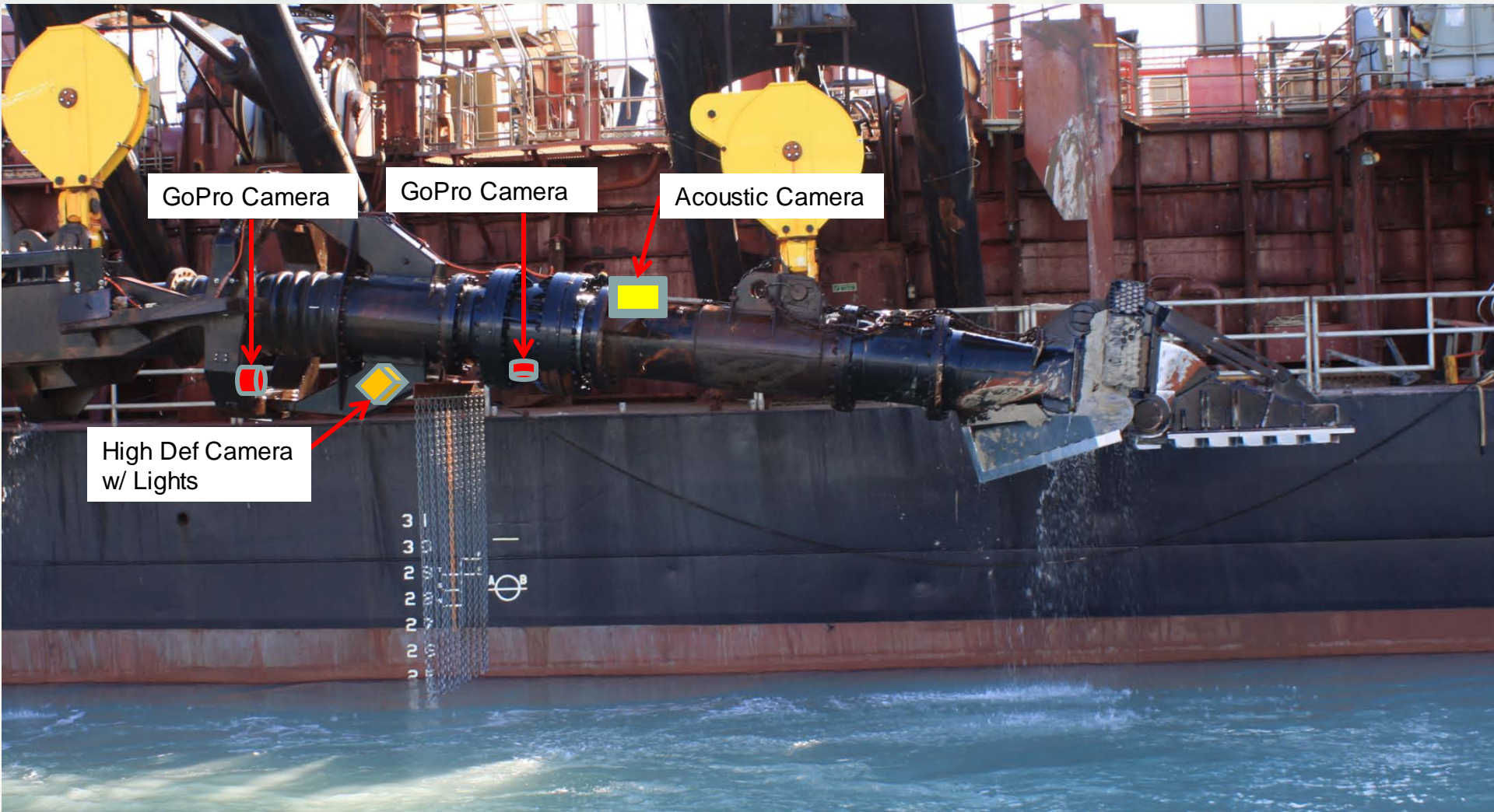


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GoPro Camera

GoPro Camera

Acoustic Camera

High Def Camera
w/ Lights



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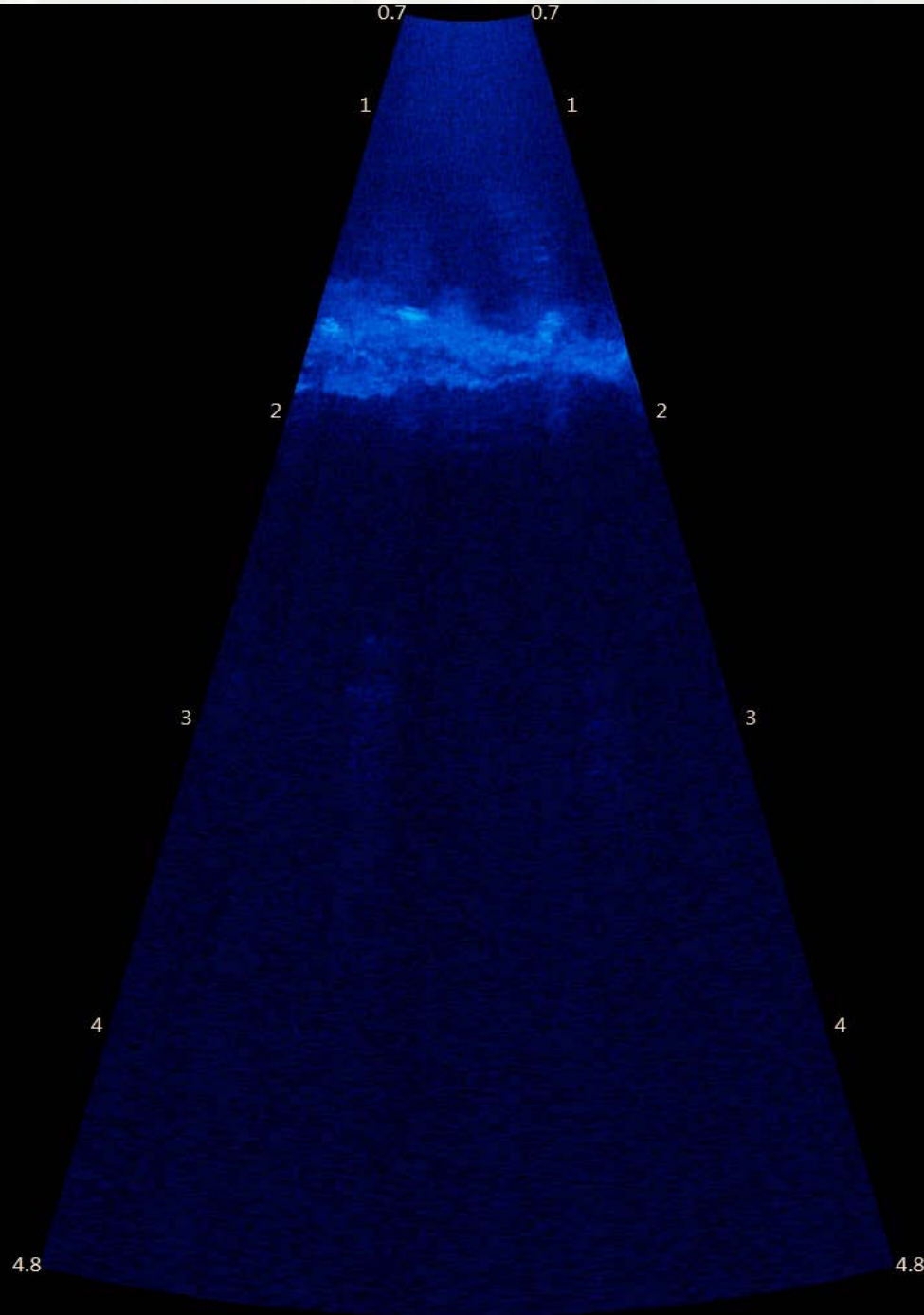
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Kalaeloā Barbers
Point, Oahu,
Hawaii

ESSAYONS' turtle
chains in the
bottom material



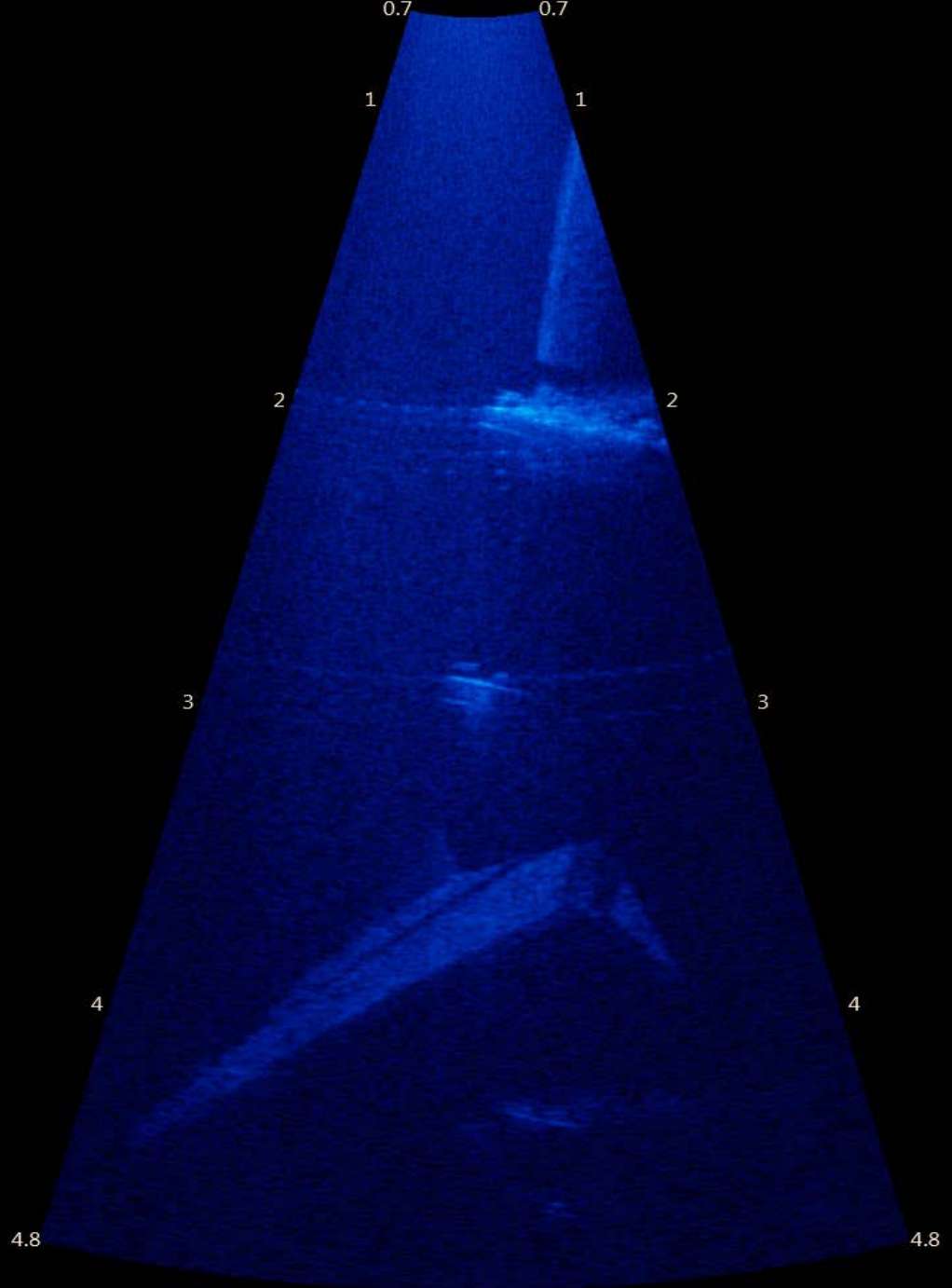
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Kalaeloa
Barbers Point,
Oahu, Hawaii

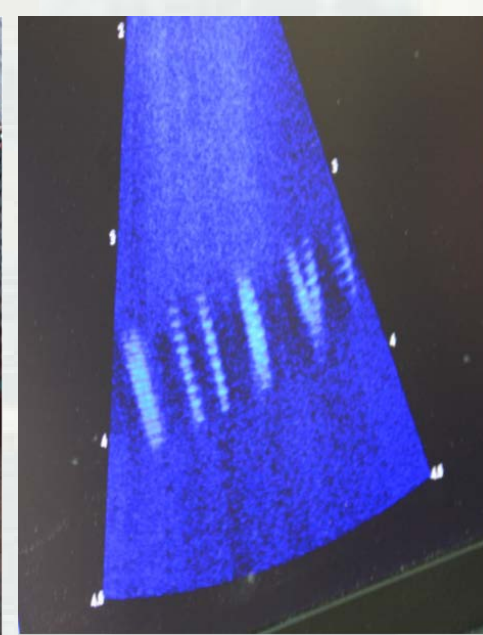
ESSAYONS'
draghead in
the finer-
grained
bottom
material.



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Study Successfully Demonstrated:

- Feasibility of mounting cameras on dragarm for monitoring.
- Acoustic camera works in extremely limited visibility and on a dynamic dragarm for monitoring chain behavior.
- Feasibility of deploying tickler chains off the dragarm
- Tickler chains maintained contact on bottom and do not entangle.
- Draghead deflector deployed correctly and generated required sediment wave.



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Way Forward

- Pending DOER funding
- Develop full-scale implementation strategies
- Extensive coordination among USACE, NMFS, dredging contractors, and other stakeholders
- Facilitate opportunities to document effectiveness of TTC and implement as replacement to deflectors



QUESTIONS?



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