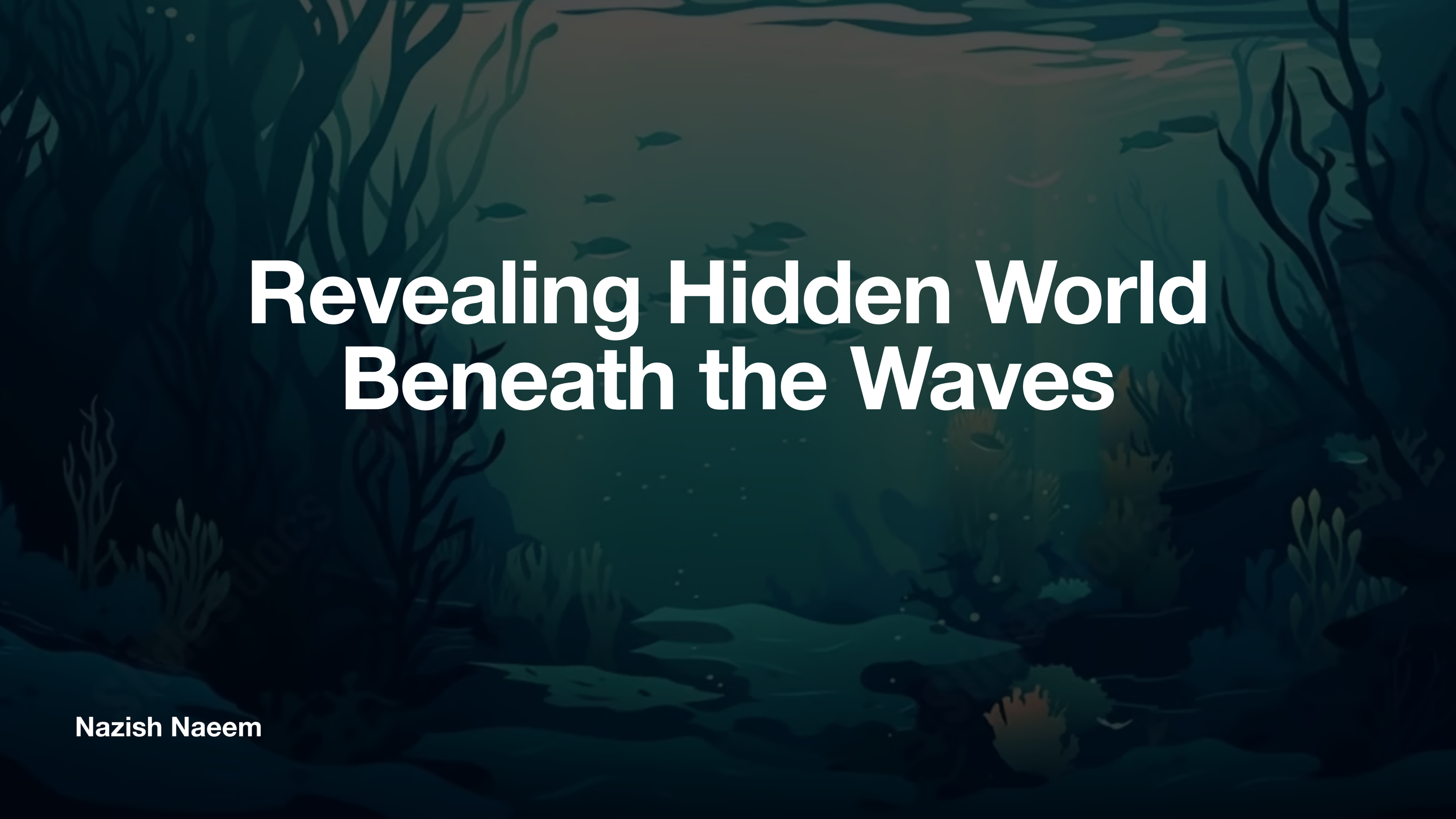
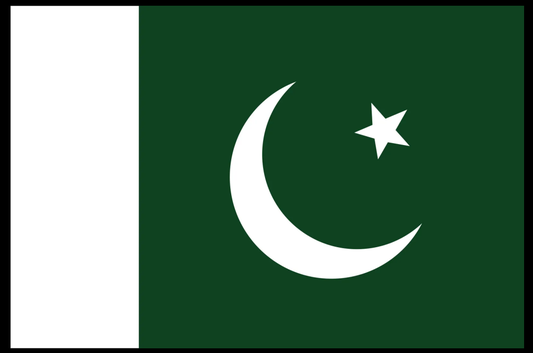


Revealing Hidden World Beneath the Waves

Nazish Naeem

Who am I?

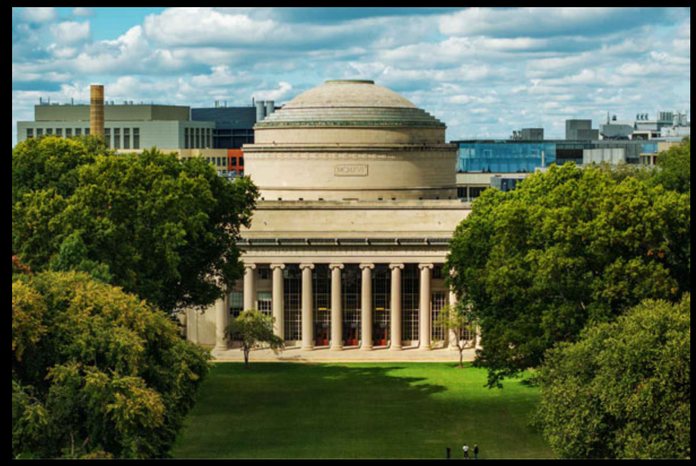




Pakistan



Undergraduate (LUMS)
Electrical Engineering



Masters (MIT)

How can we sense hidden world under the waves?

Are you Ready for a Trivia?

How much of the Earth is covered by the Ocean?

A. 42%

B. 55%

C. 71%



Are you Ready for a Trivia?

How much of the Earth is covered by the Ocean?

A. 42%

B. 55%

C. 71%



Are you Ready for a Trivia?

The deepest point recorded is _____

A. 830m (Burj Khalifa)

B. 8,846m (Mount Everest)

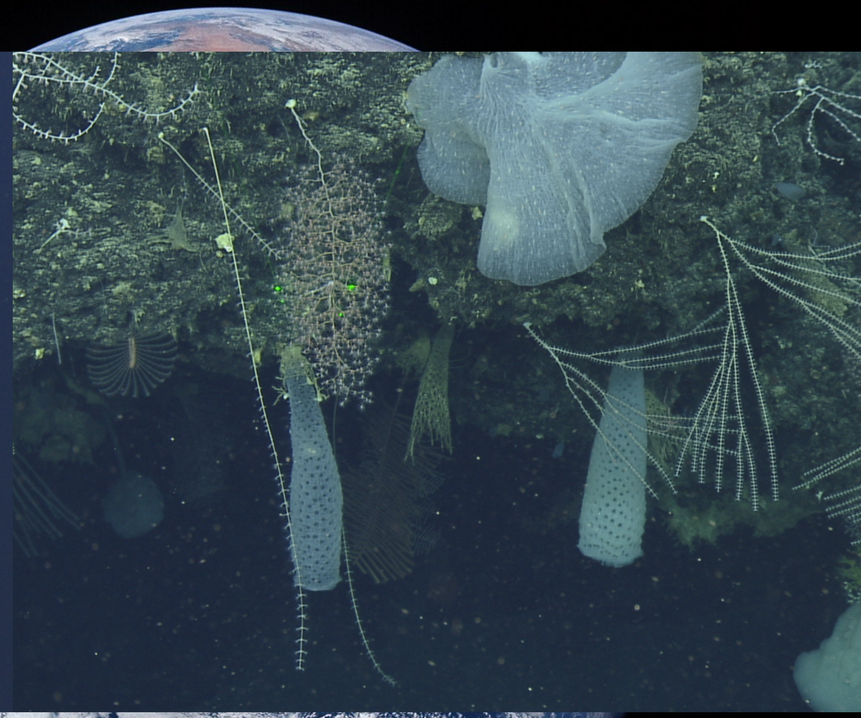
C. 10,994m (>Mount Everest)



Are you Ready for a Trivia?







C. 10,994m (>Mount Everest)

Credit: Ocean Exploration Trust

Are you Ready for a Trivia?

How much of it is unexplored?

A. 40%

B. 50%

C. 80%



Are you Ready for a Trivia?

How much of it is unexplored?

A. 40%

B. 50%

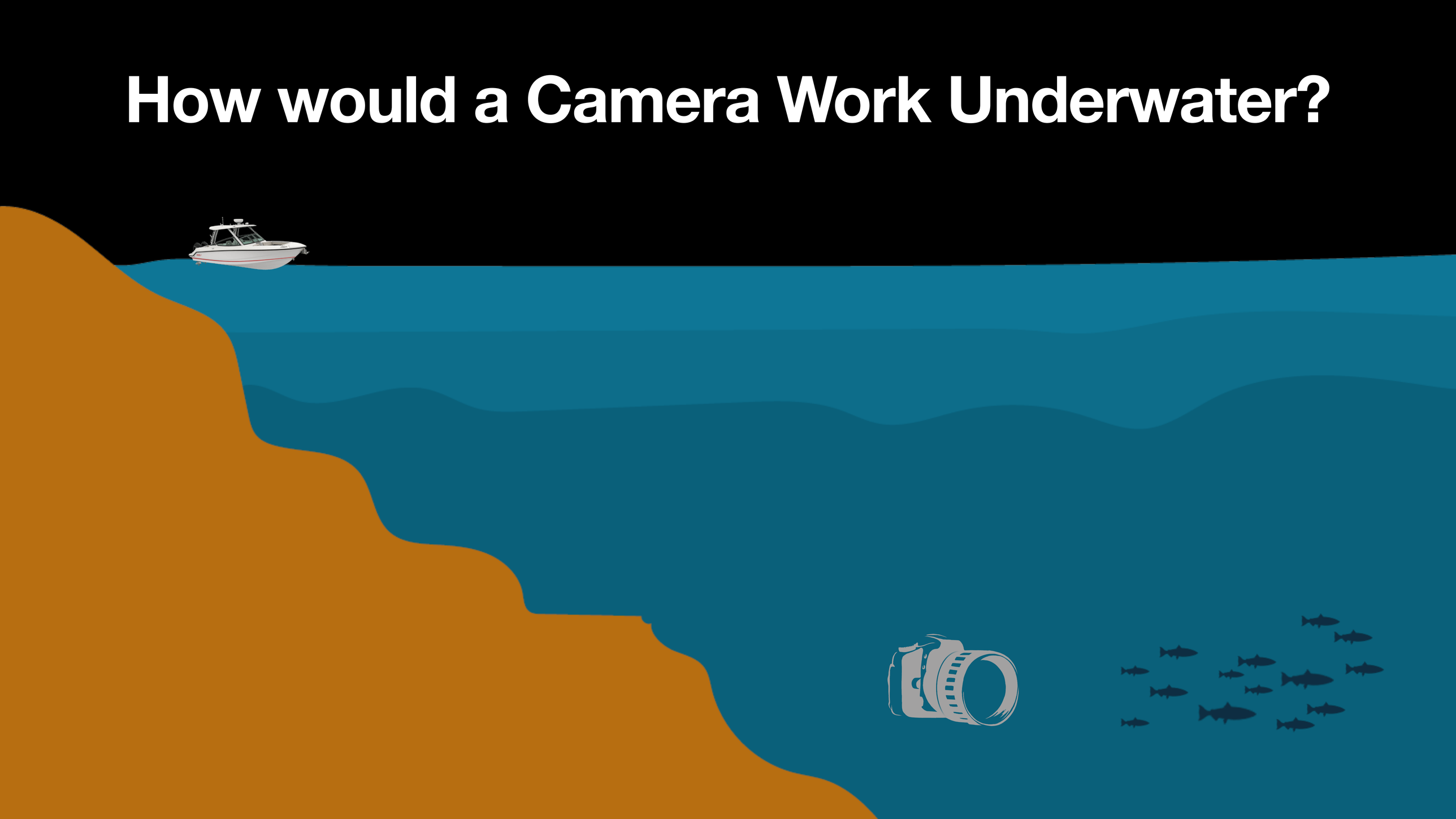
C. 80%



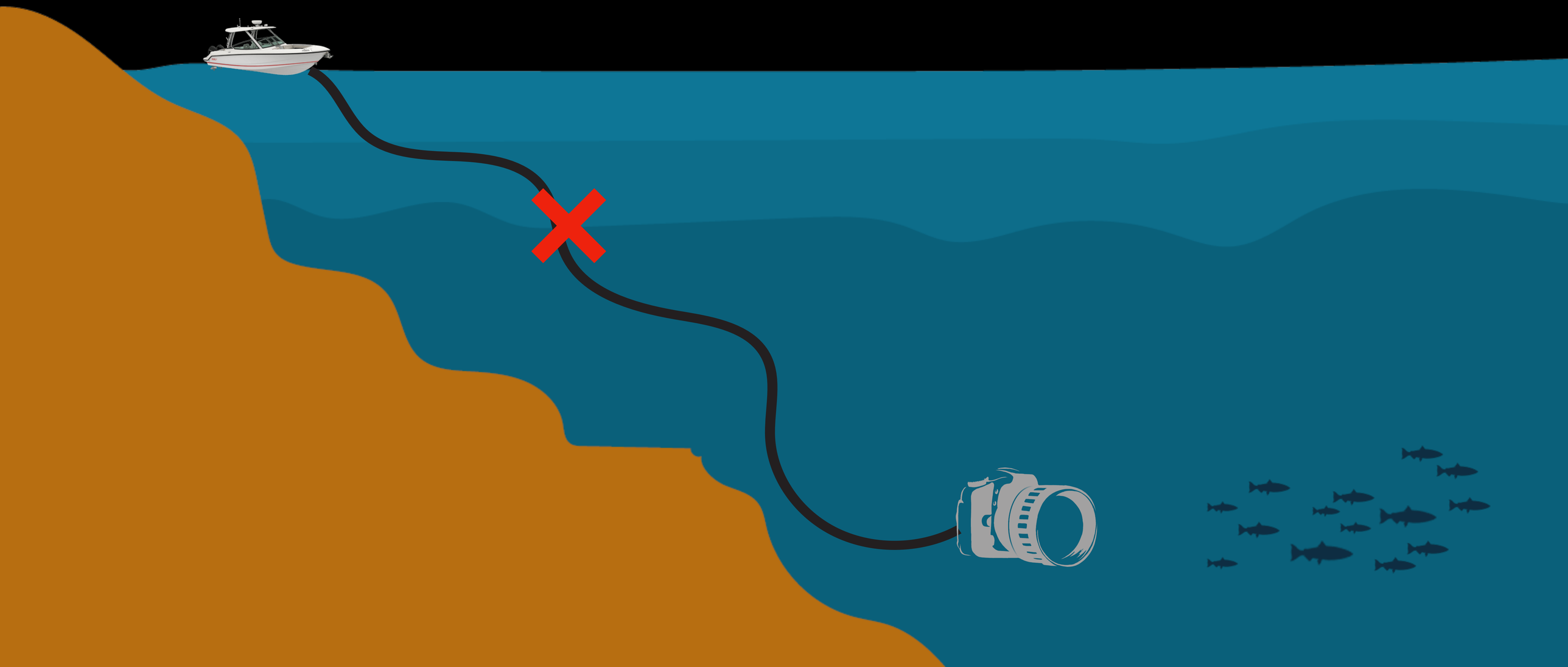
Why is Ocean still unexplored?



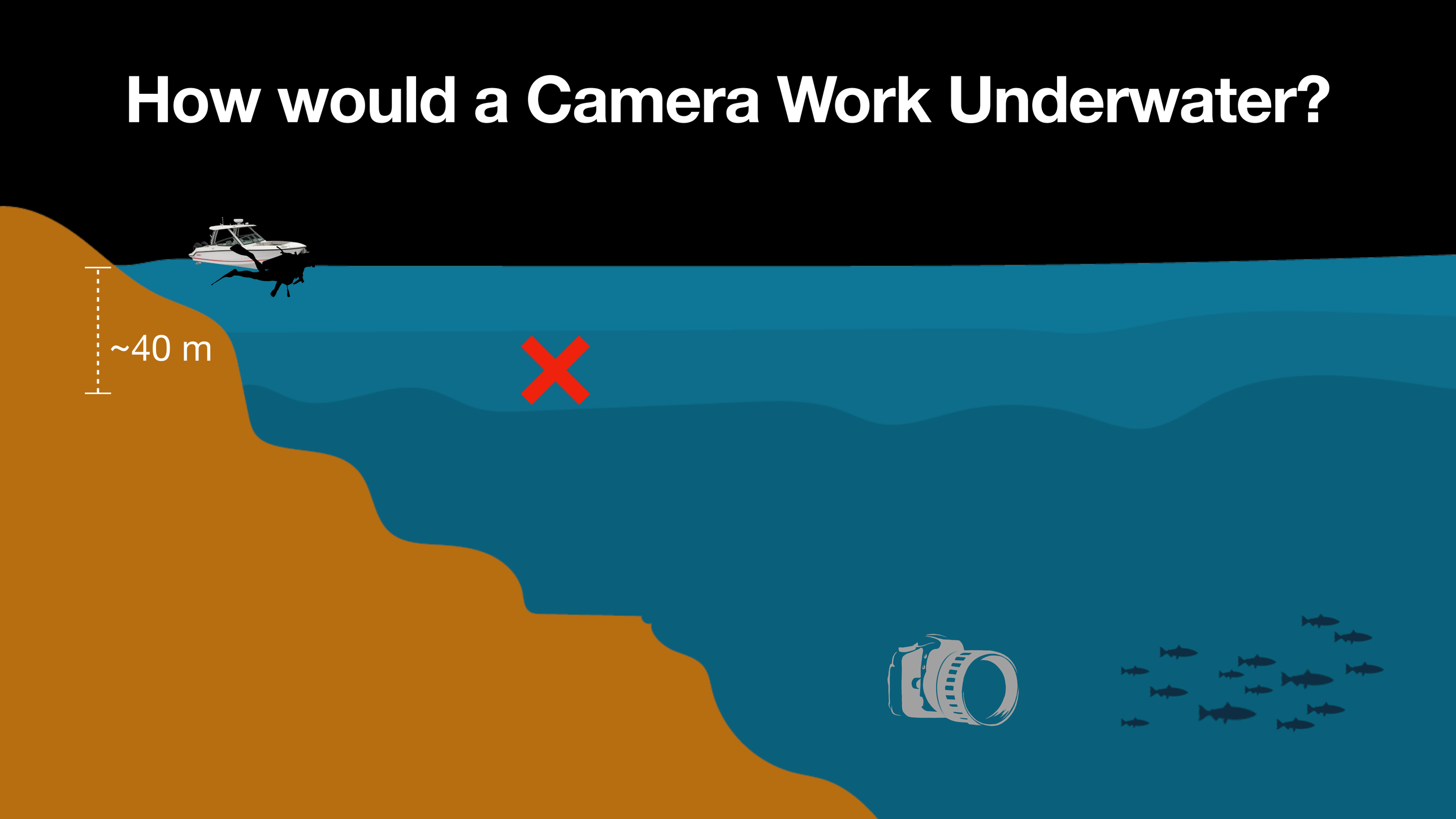
How would a Camera Work Underwater?



How would a Camera Work Underwater?



How would a Camera Work Underwater?



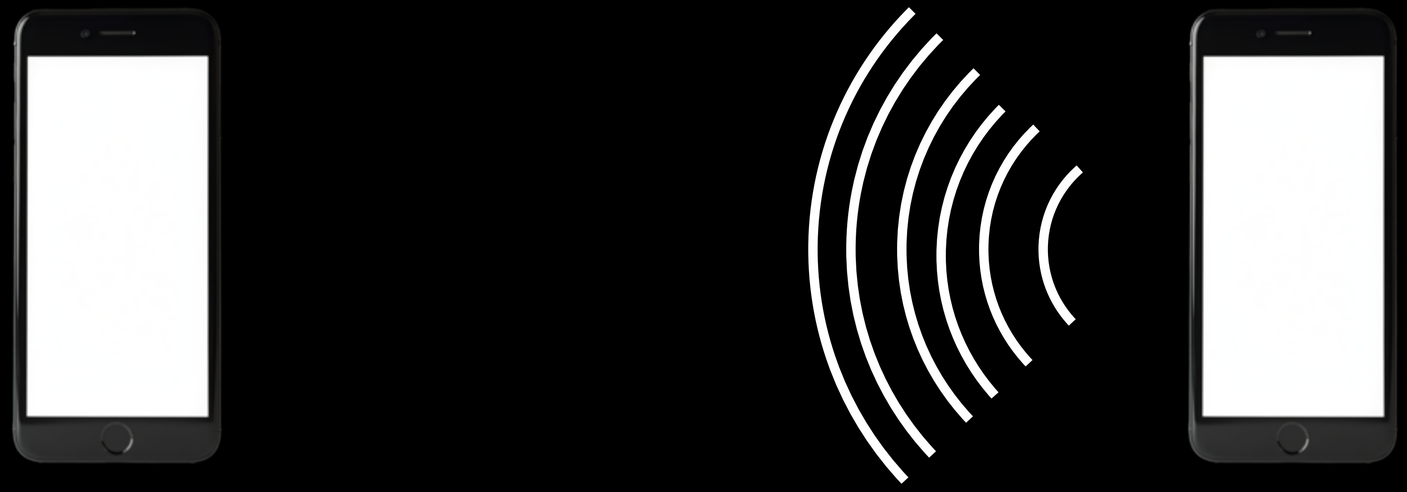
How would a Camera Work Underwater?



Can we use smart phones?



Can we use smart phones?



How do we Communicate?



Underwater Communication via Sound

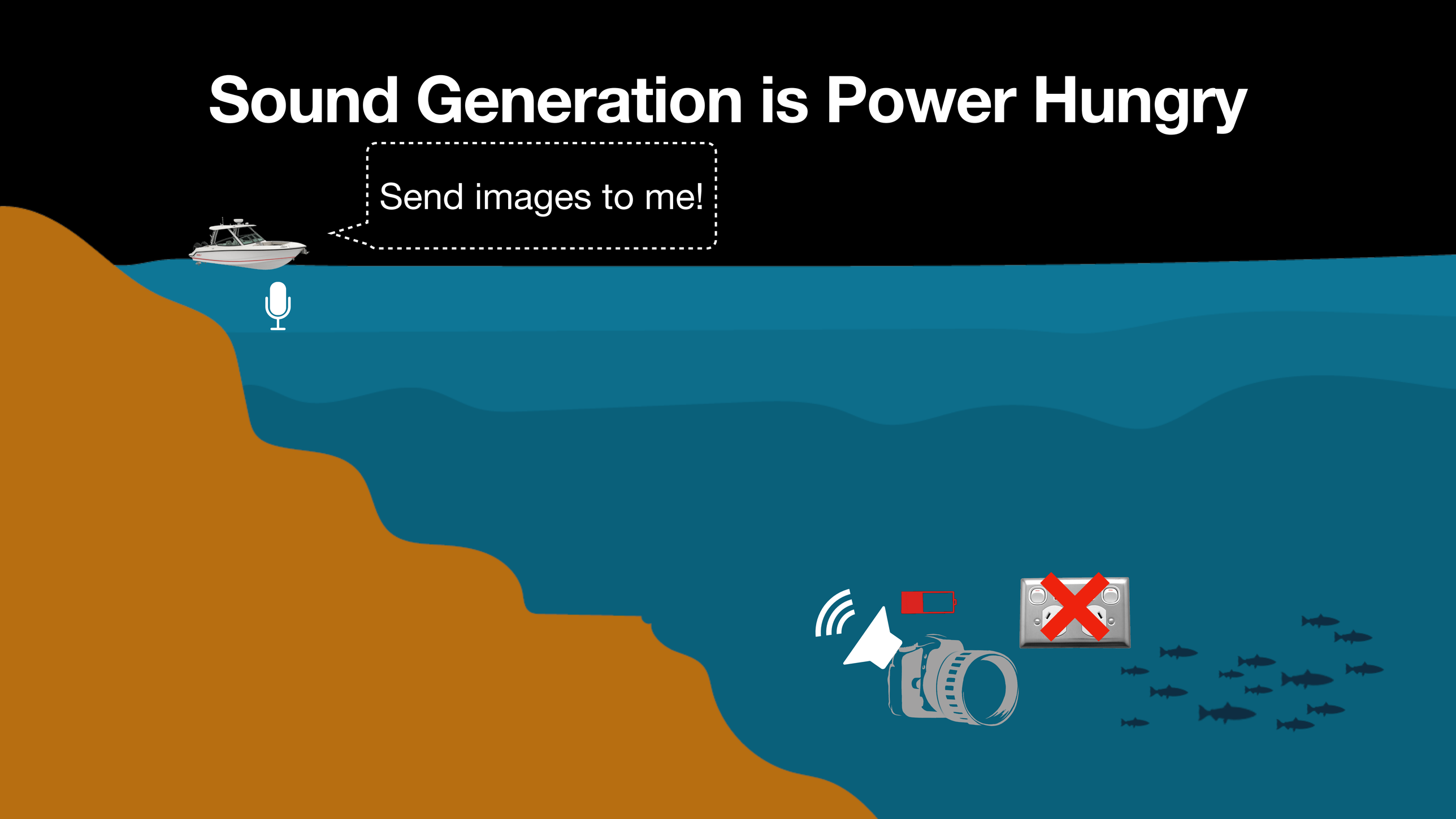




Underwater Communication via Sound



Sound Generation is Power Hungry



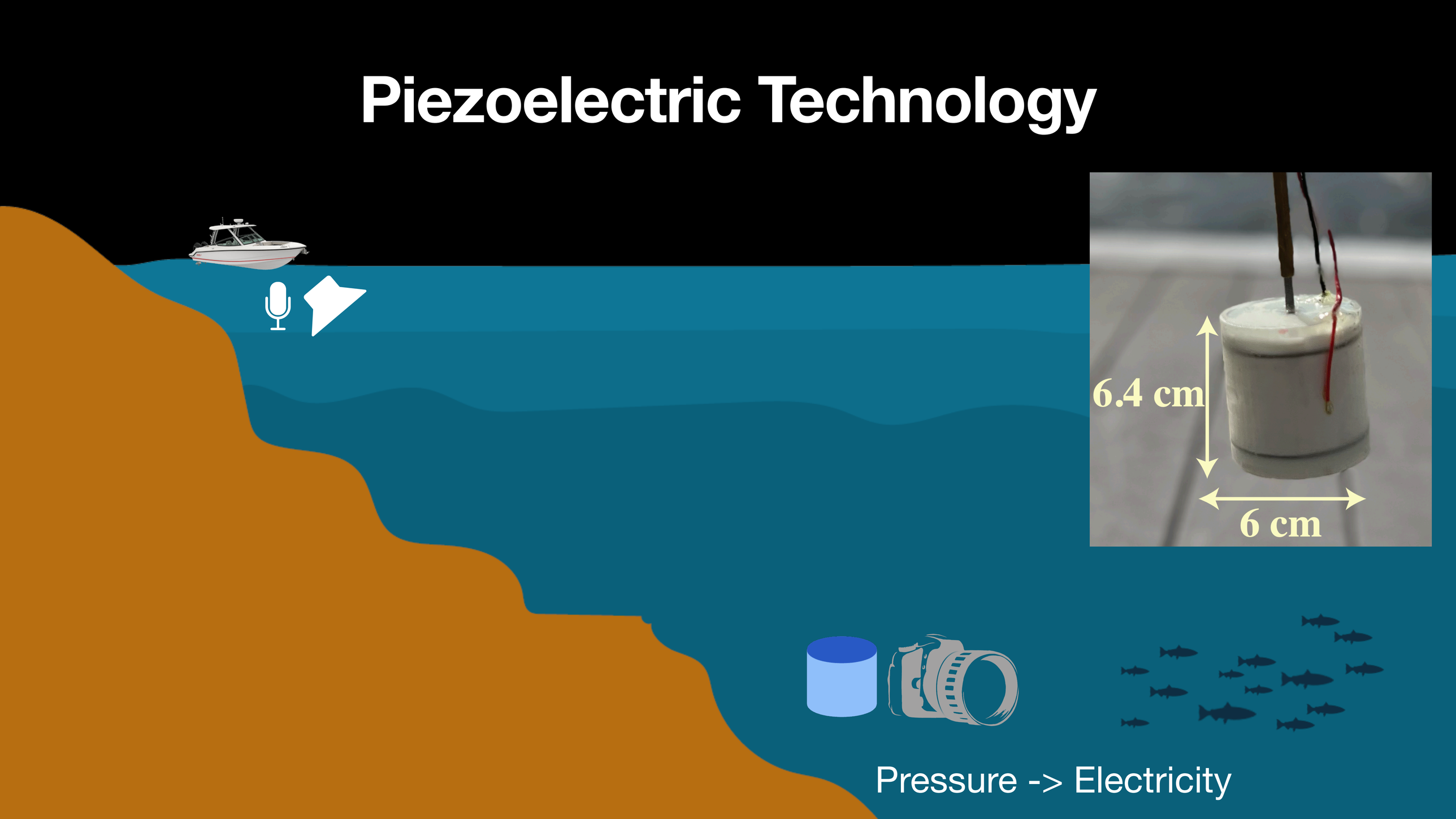
My Research

Building Longterm and Sustainable Wireless Ocean Sensing Systems

How do we make the underwater systems sustainable?

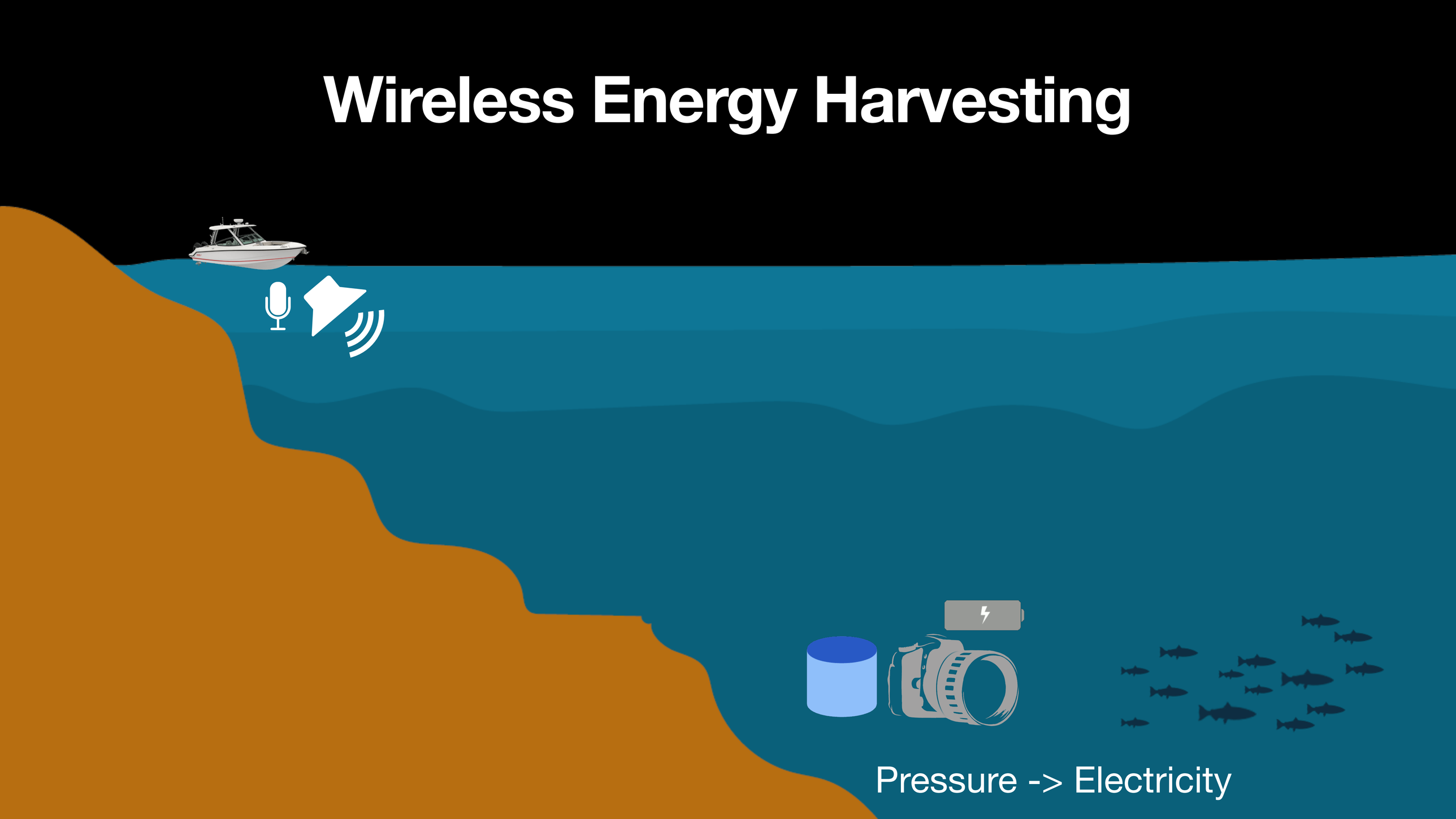


Piezoelectric Technology



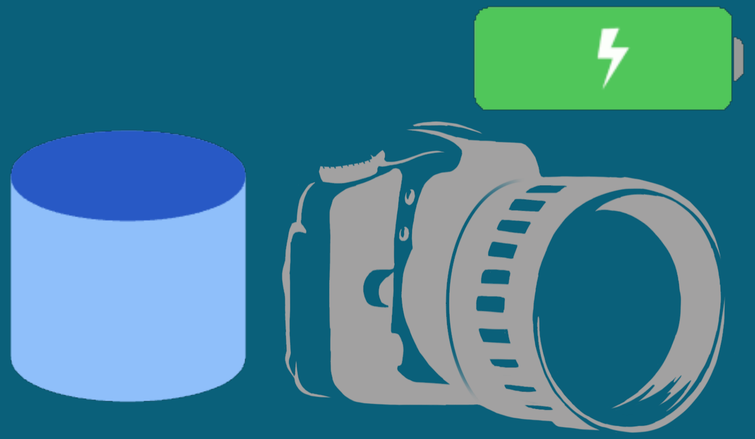
Pressure -> Electricity

Wireless Energy Harvesting



Pressure -> Electricity

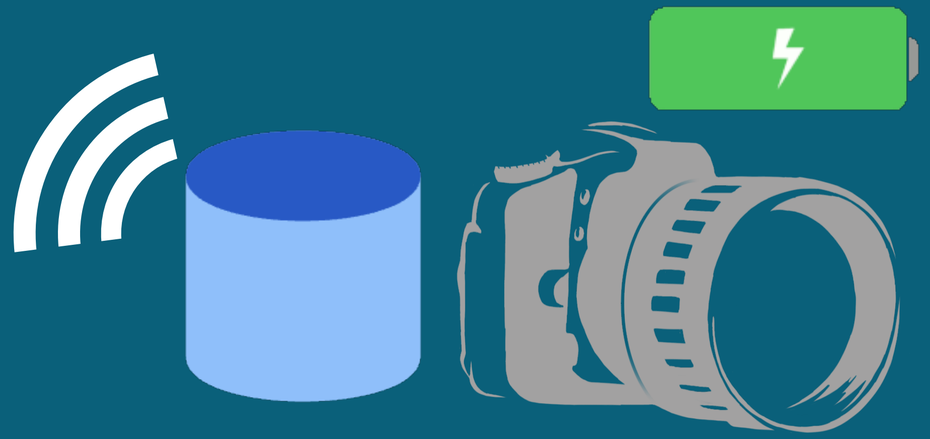
Wireless Sensing and Communication

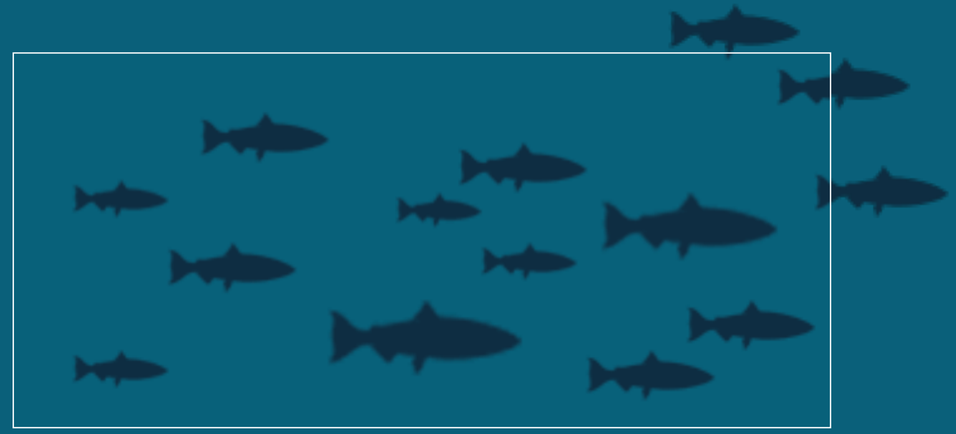




Pressure -> Electricity

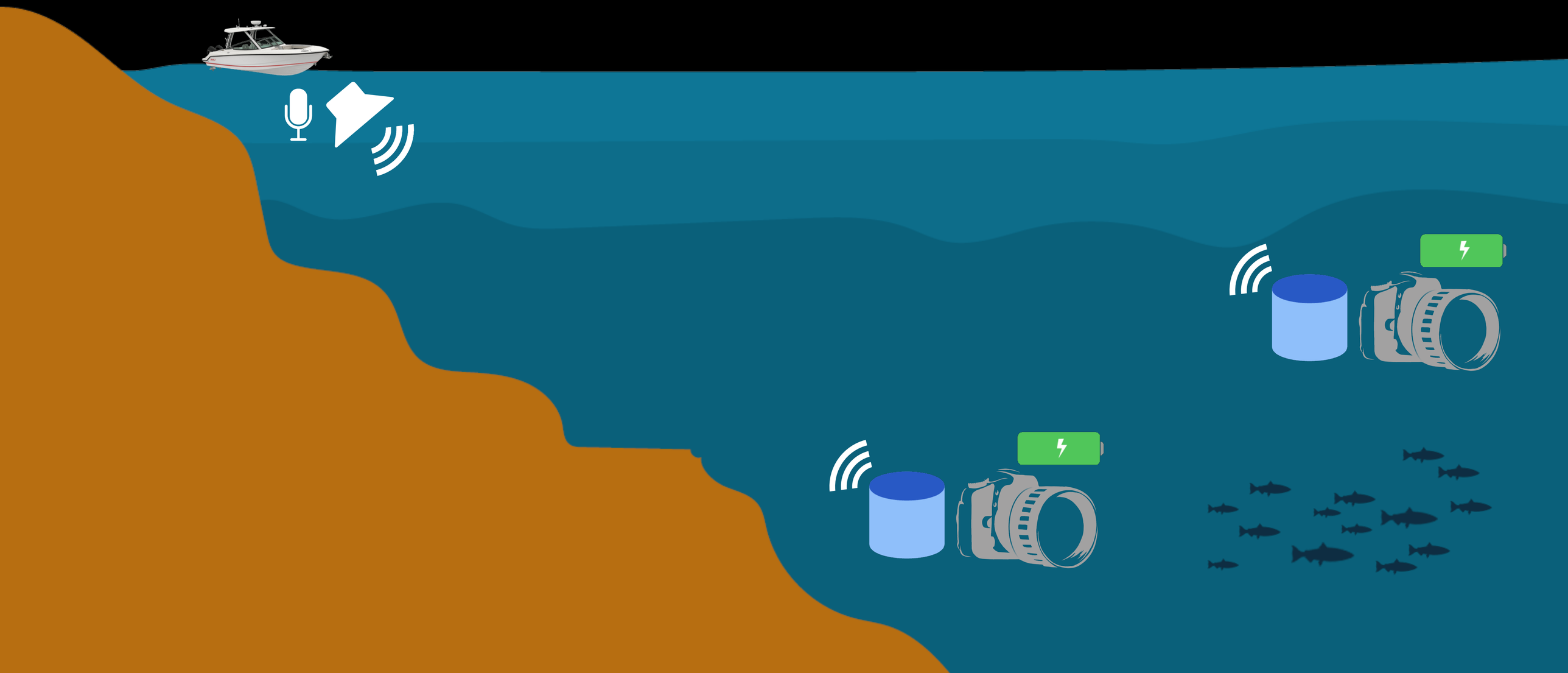
Wireless Sensing and Communication





Pressure -> Electricity

Network of Underwater Sensors



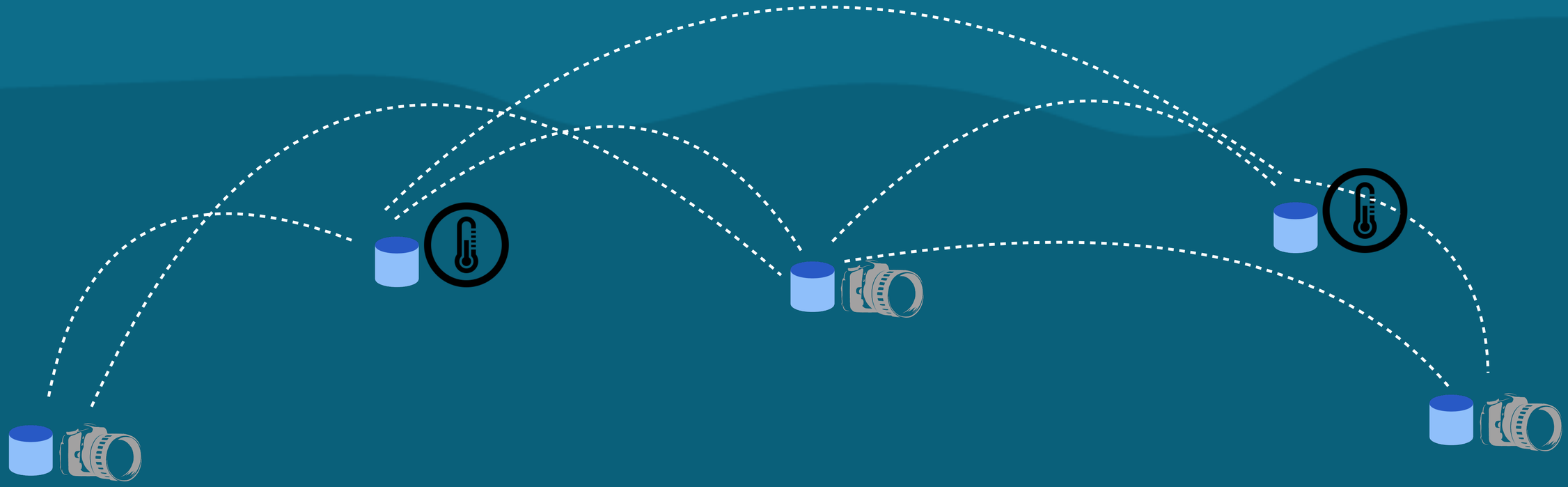
Here is the Camera!



Here is the Camera!



What am I working on next?





Energy-Efficient Underwater Camera



Net-Zero Power OceanIoT

Instagram: @mit_sk_lab