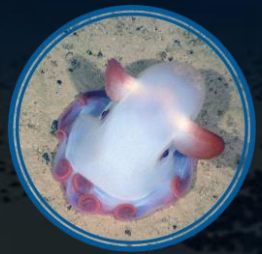
IMPOSSIBLE METALS

Economically viable selective harvesting of polymetallic nodules





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PLEDGE 1% pledge1percent.org PROUD MEMBER

B Corporation

Our Foundation

Accelerating clean energy by delivering the most sustainable battery metals

To harvest and process critical battery metals from the seabed, while protecting the environment

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Design Goals

Leave nodule mega fauna and sediment fauna behind

Leave habitat intact

Superior economics

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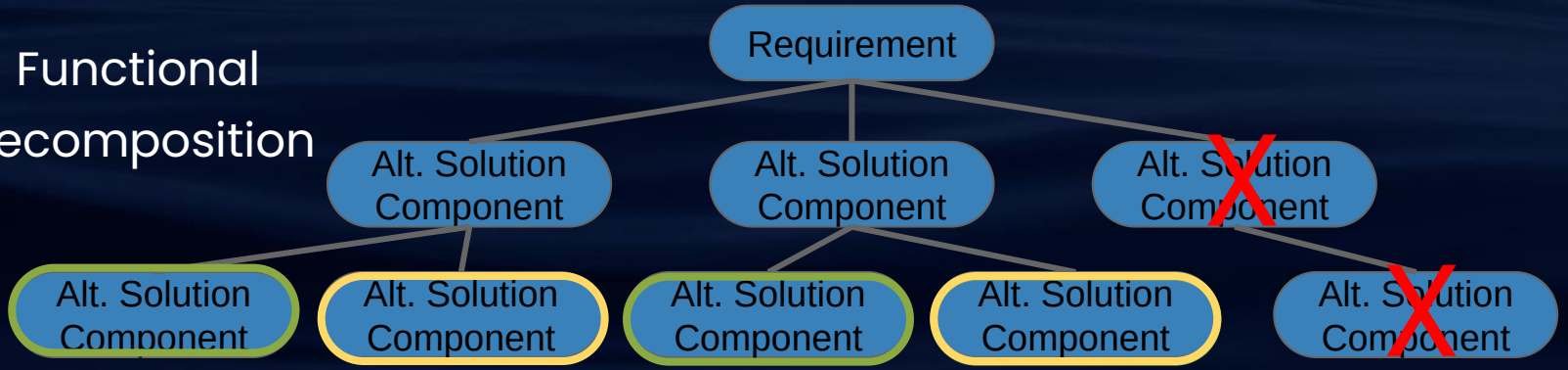
Design Approach

Functional Decomposition



Solution Build Up

Viable Solution A

Viable Solution B

Economic Comparison

$$

$$$

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Solution

Selective harvest

- Computer Vision to identify nodules and life
- Arms to individually pick up the nodules

Hover, moving over the seabed to not disturb the sediment

- High stability vehicle with thrusters far from the seabed
- Buoyancy engine for offsetting added weight

AUV fleet and integrated vertical transport

- AUV buoyancy engine lifts the nodules to the surface

Production support vessel is the ore transport vessel

- No ship to ship transfer
- Operation form vessels with minimal customization

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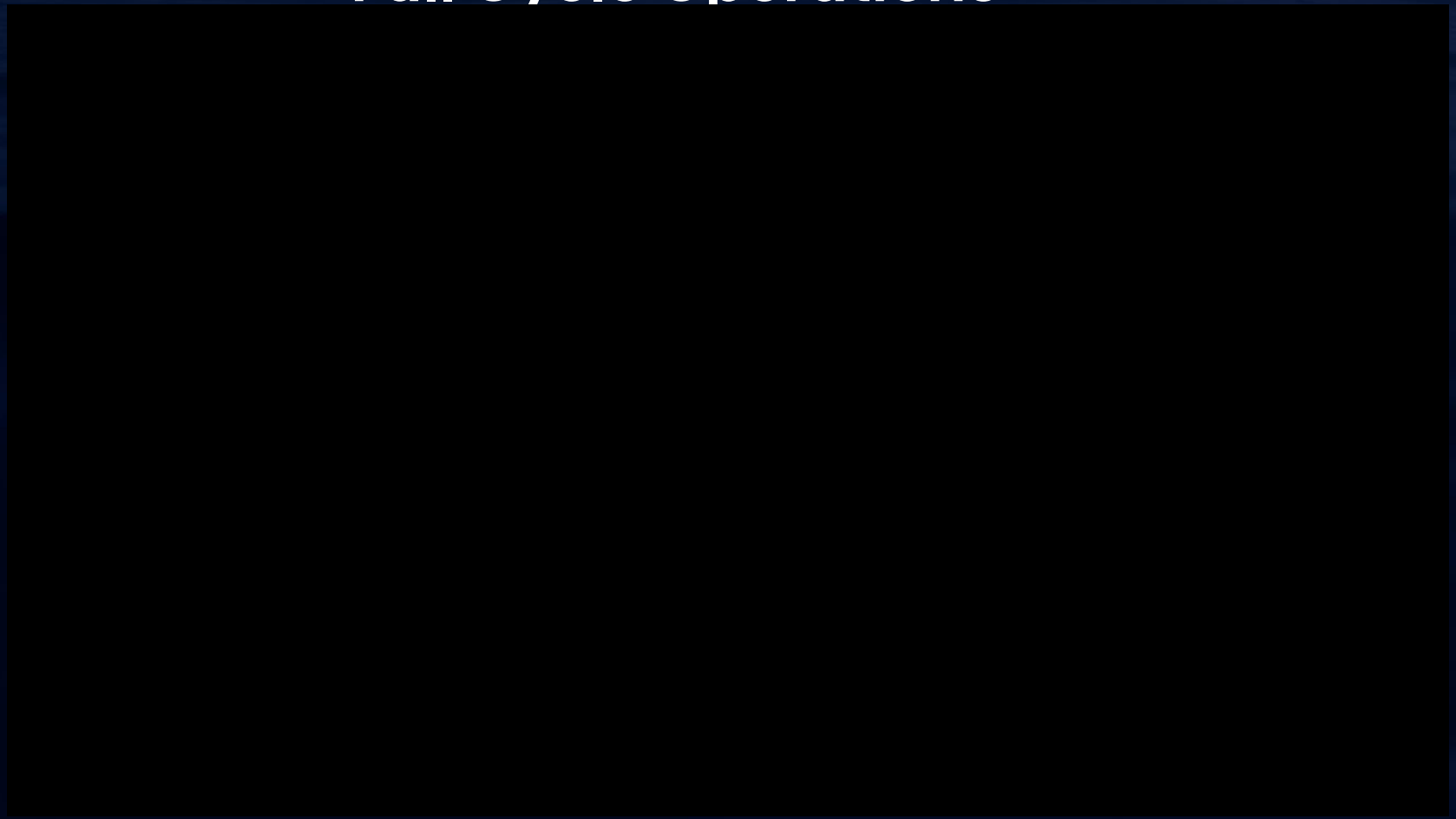
Full Cycle Operations



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Keys to Success - Computer vision and arms

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Keys to Success - Buoyancy Engine

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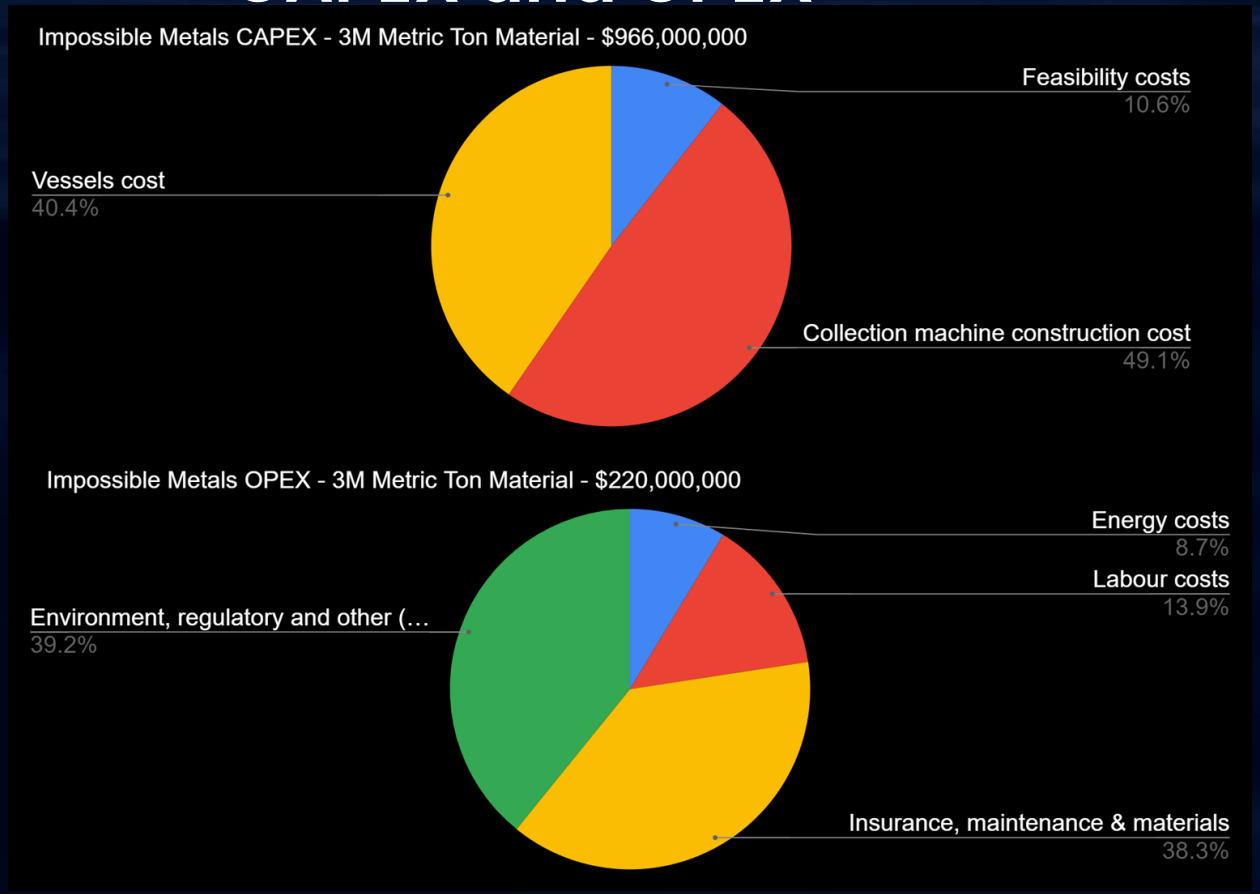
Impossible Metals Concept CAPEX and OPEX



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Key Economic Factors

$98.58
Metric Ton

Positive NPV:
3 years

- Minimal vessel customization
- Arm speed
- Buoyancy engine: cost per kg of lift

- Parallel operations: suitable system

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AUV Technology Readiness Roadmap

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V3 Objectives

Overall objective is to prove out the key technologies not collection of nodules at scale.

- Develop and demonstrate key enabling technology
  - Buoyancy Engine
  - Arms
- Demonstrate integrated operation
- Fast development - not elegant

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Prototype Collection System

HDPE Frame

12 Thrusters

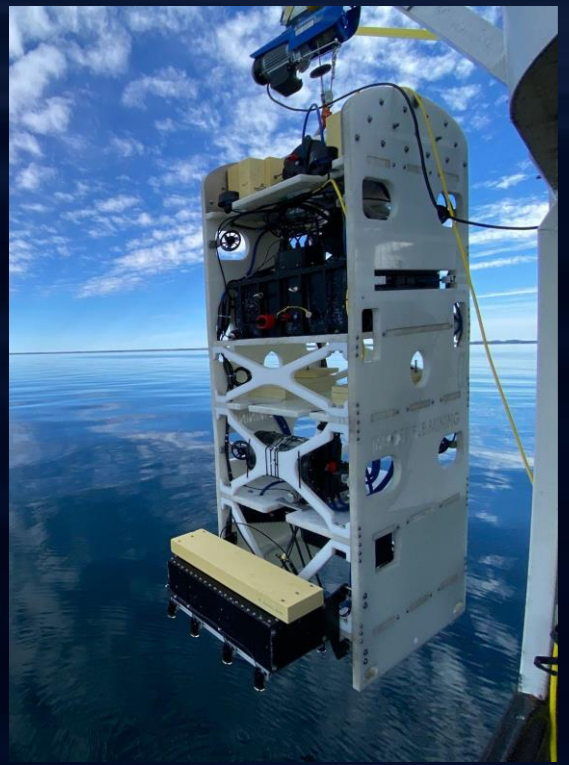
4 Vessel Buoyancy Engine

Robotic Arm

Communications and Electronics Housings

Battery Pack

Vision System



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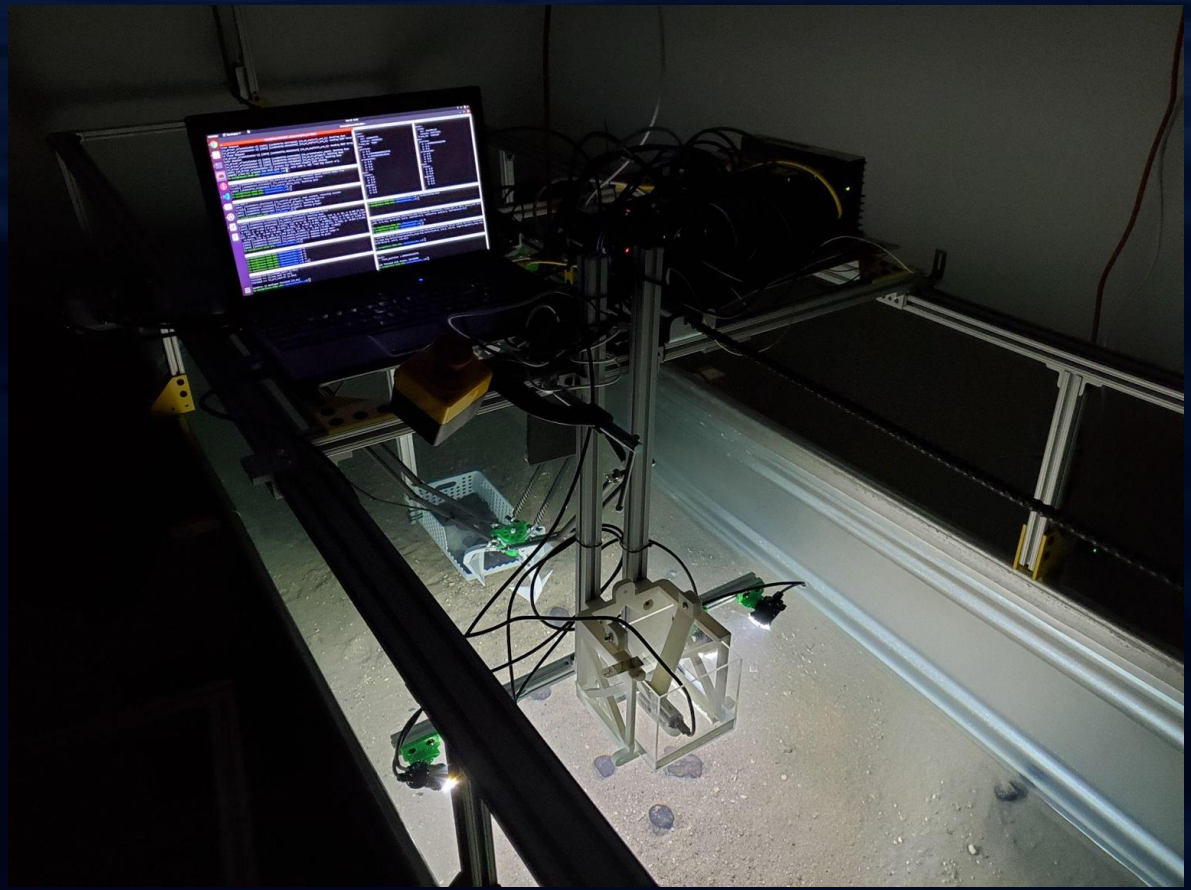
Tow Tank



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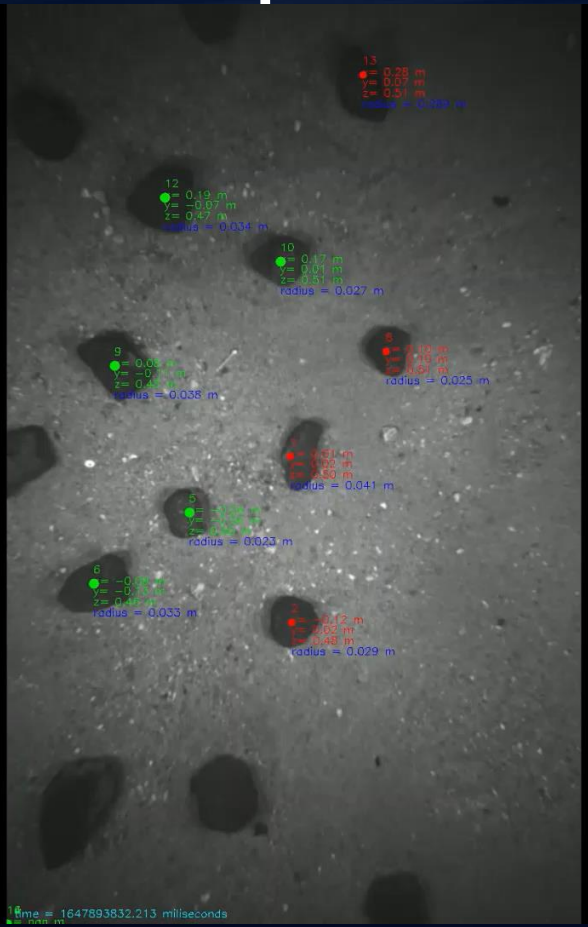
Tow Tank - Computer Vision



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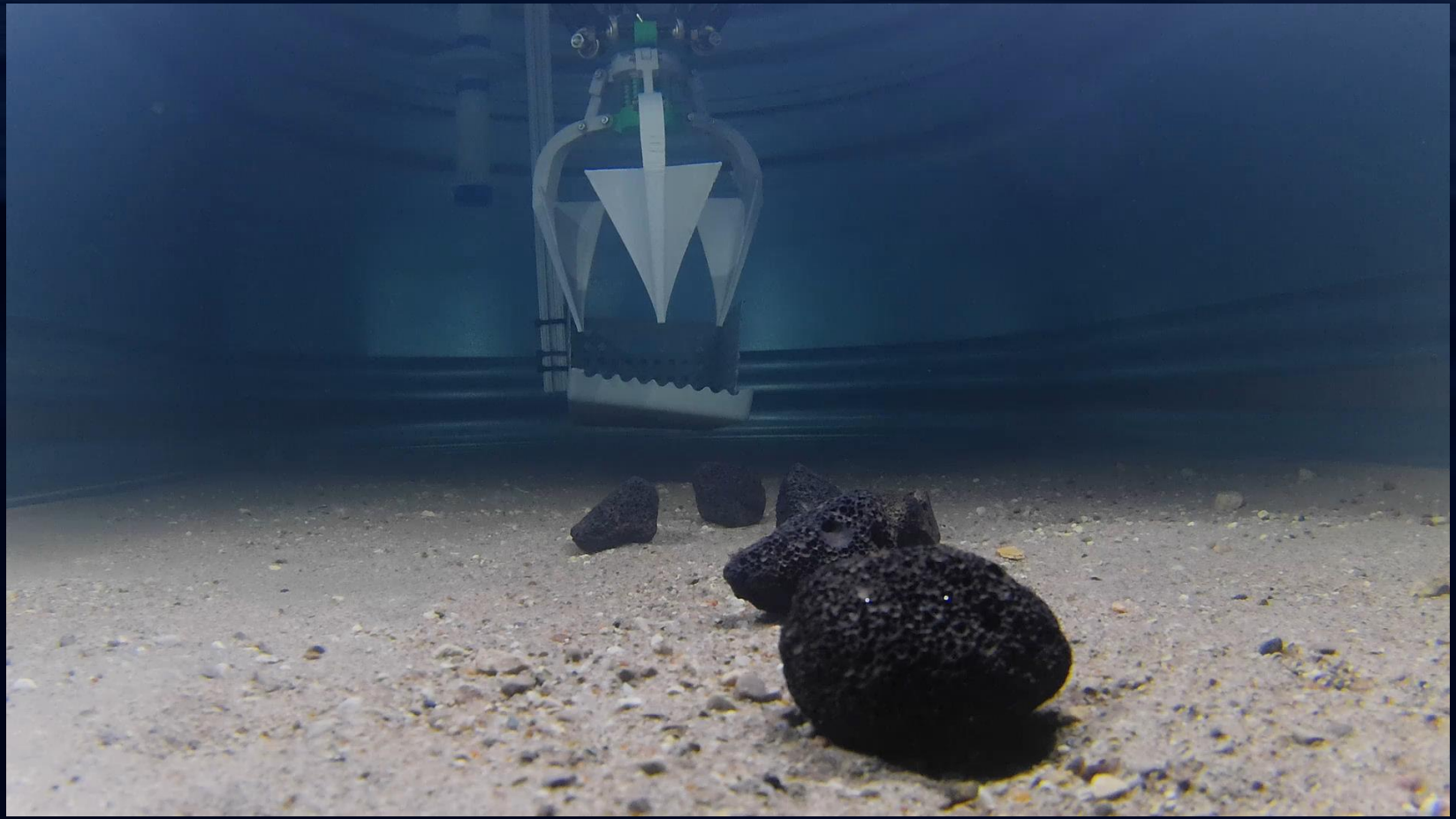
Tow Tank - Arm



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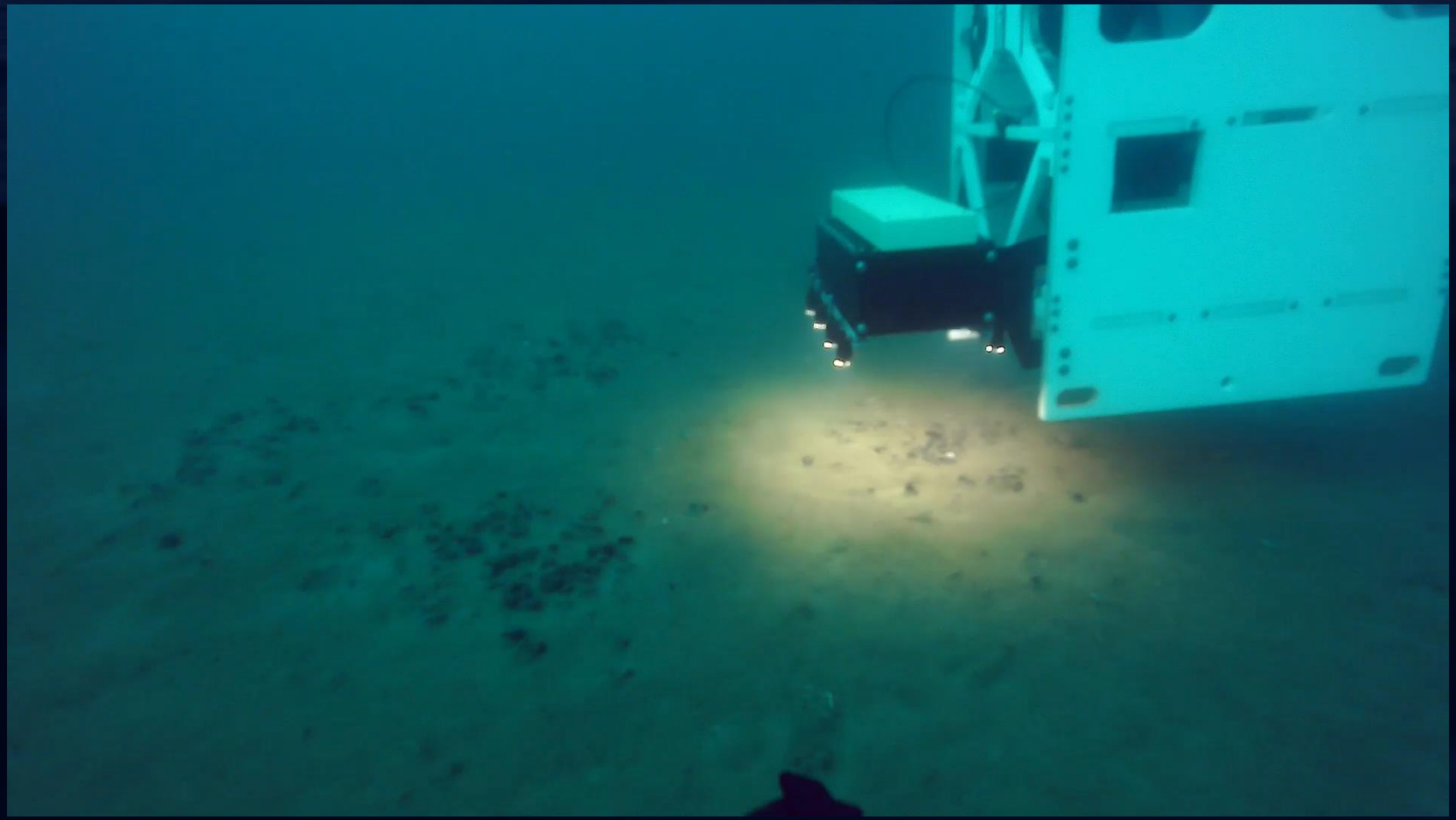
Basic Autonomous Control



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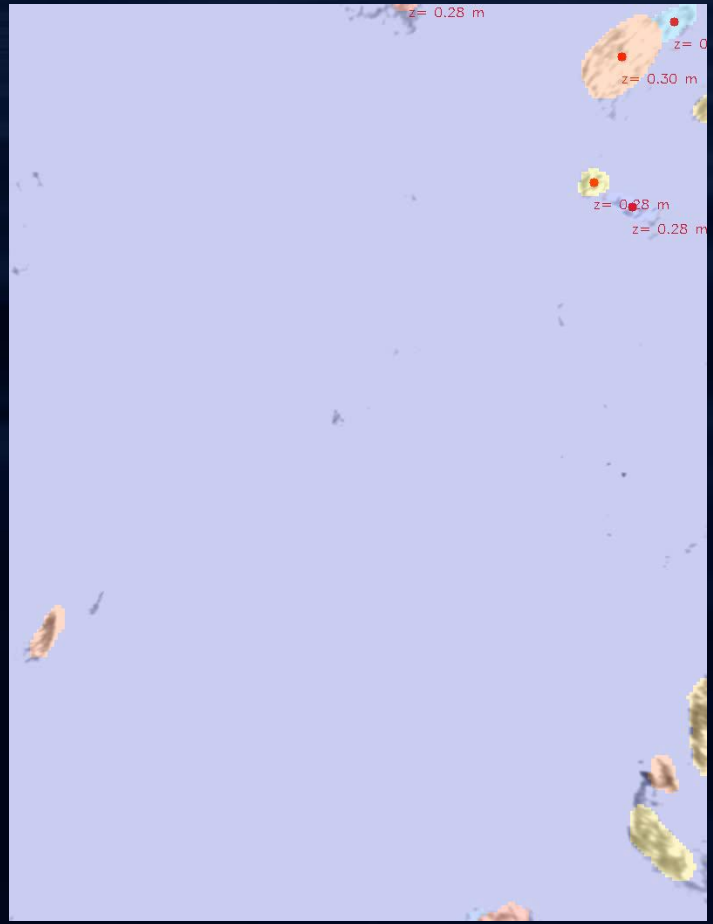
Lakebed Vision System



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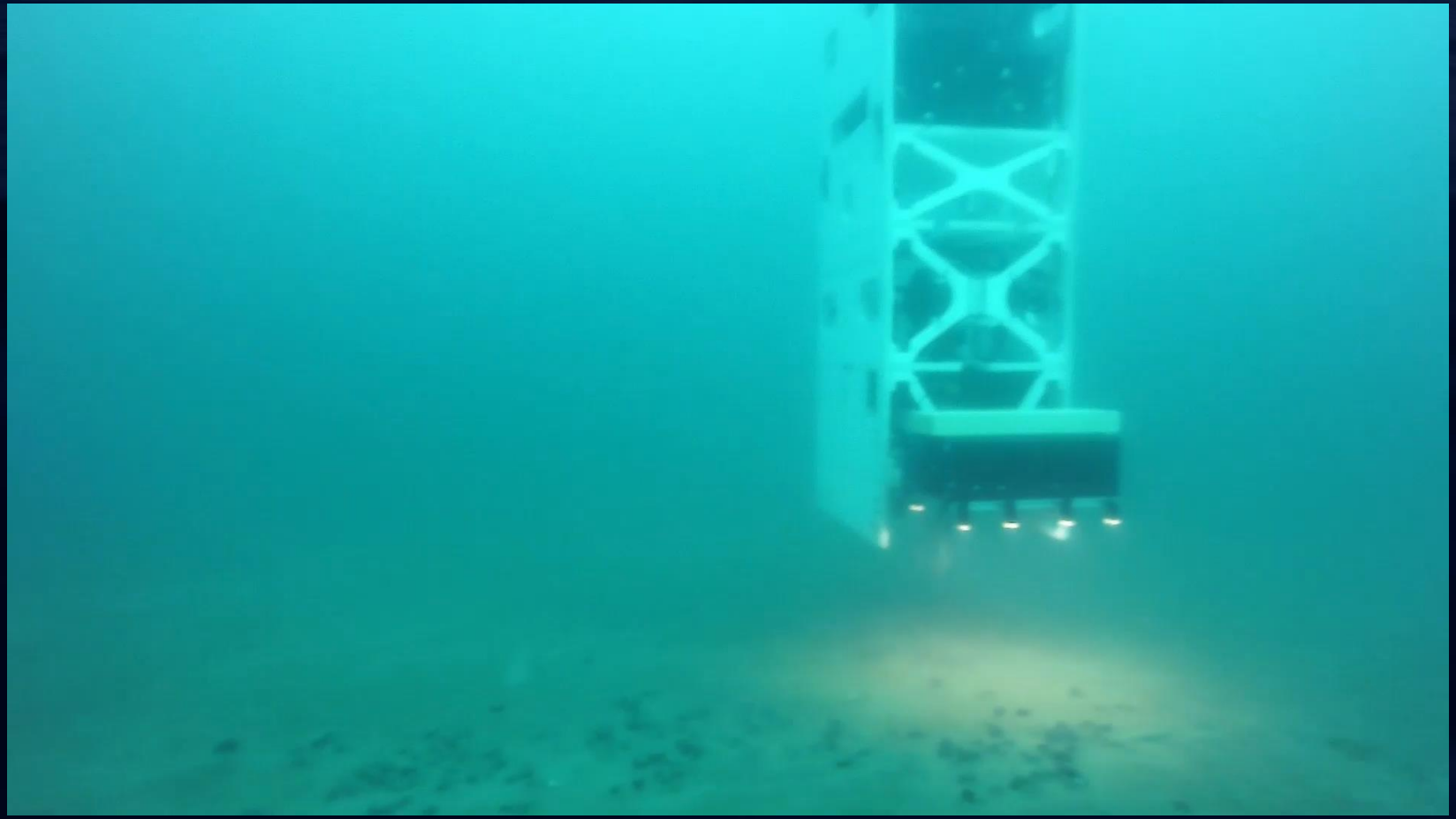
Lakebed Arm Testing



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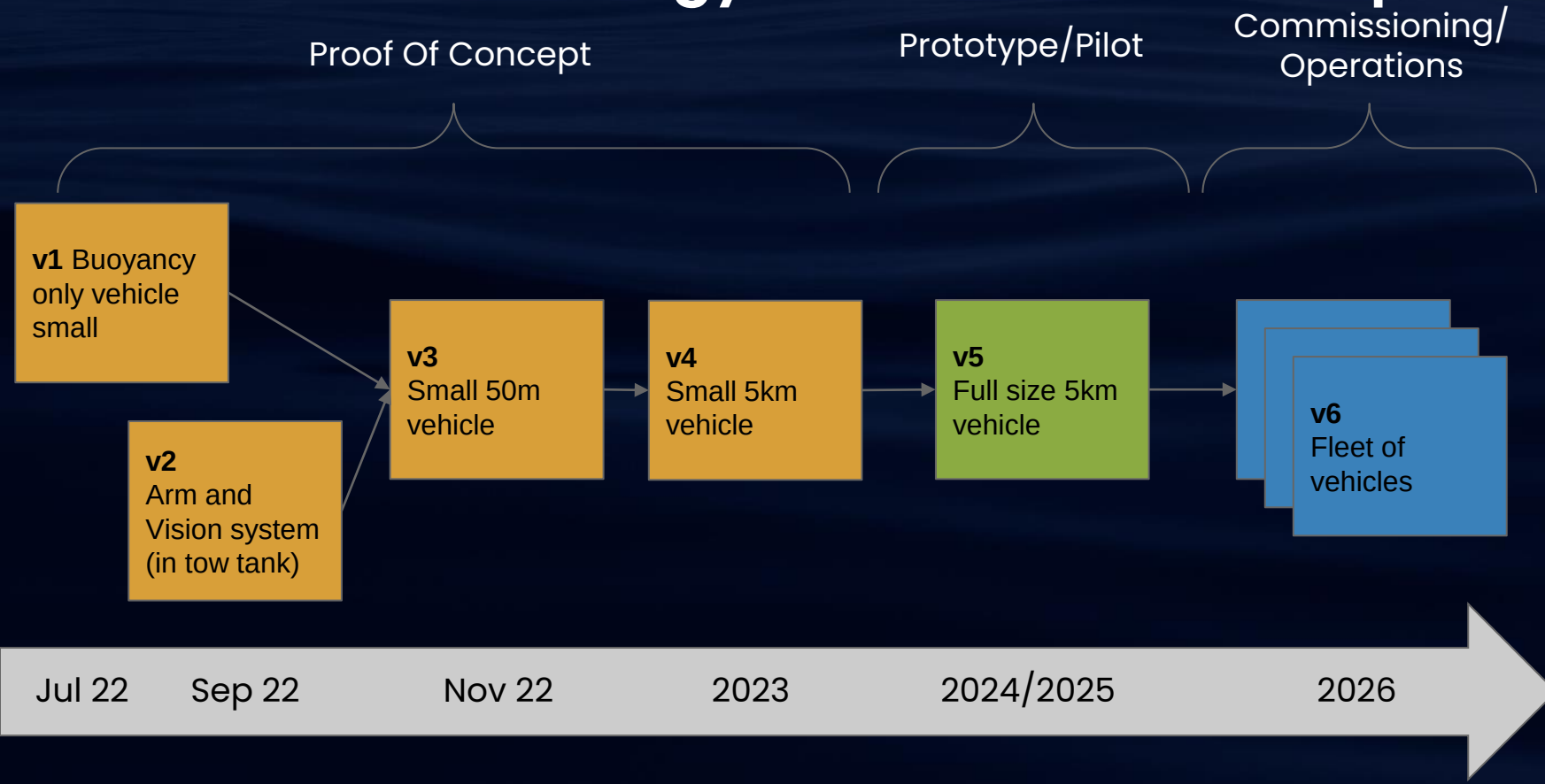
AUV Technology Readiness Roadmap



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Why Selective Harvesting

- Developed with Environmental Science and Economic Principles
- Demonstration of the key enabling technologies
- On track for complete V3 this year

- We want to get additional partners involved. We are targeting having the deep water testing in 2023 subject to regulatory pathways.

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