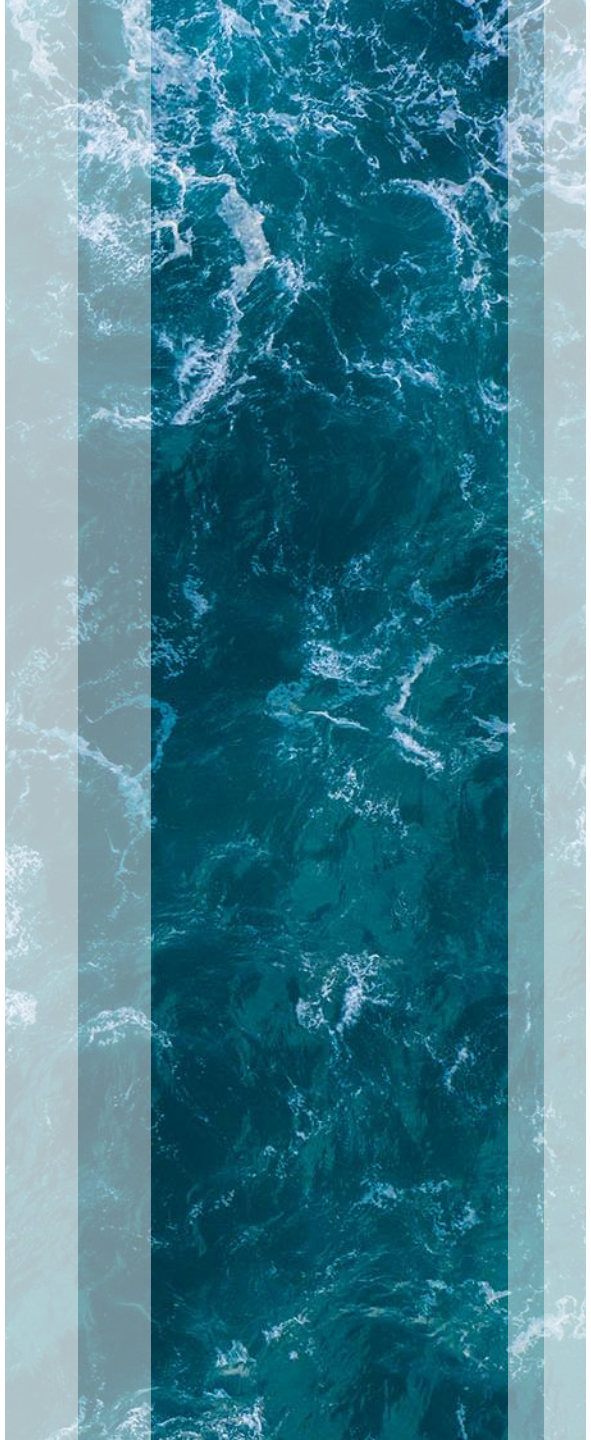


Automating OBN surveys with MantaRay™ AUV

PXGEO

12 April 2024

SEAPEX Technology Forum

Marine Towed Streamer

Lower operational costs and faster turnaround

Limited azimuthal response

Restricted geometries

Limited offsets

Higher 4D noise

High noise environment

Consistent illumination of the water bottom and shallow over-burden

Ocean Bottom Node

Higher operational costs and timelines

Full Azimuth response

Unconstrained geometries

Ultra long-offsets

Excellent receiver repeatability*

Low noise environment

Inconsistent illumination of the water bottom

The industry has accepted that ROV-deployed ocean bottom node projects deliver the optimum seismic reflection measurements

OBN Deployment Technologies

	NoaR	ROV	AUV
Scalable			
Efficient			
Water depths	0-xxx	15-3,000 m	3-3,000 m
Coupling			
Repeatability			
Fold			
Design flexibility			
Environment			

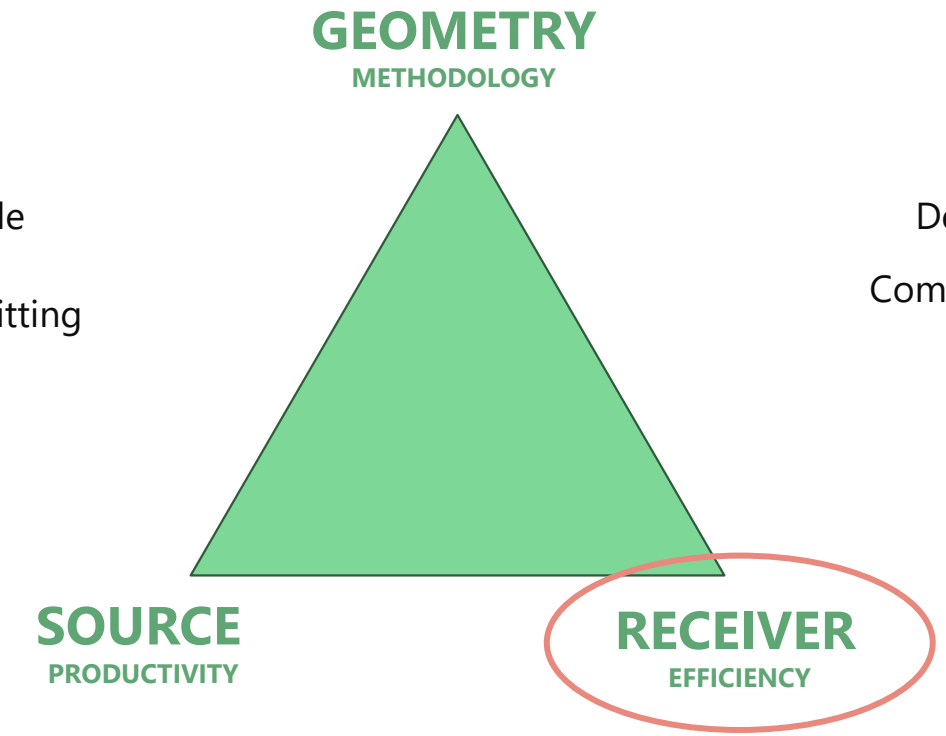
Compromises in Current Node Survey Design

Symmetrical sampling is the geophysical ideal

ROV Deployment

Designs heavily weighted to the source-side

Clients favor denser node grids, cost permitting



NOAR Deployment

Designs weighted in the inline direction

Compromises in node placement accuracy and coupling integrity

MantaRay™

The future of Ocean Bottom Seismic

Sabertooth AUV

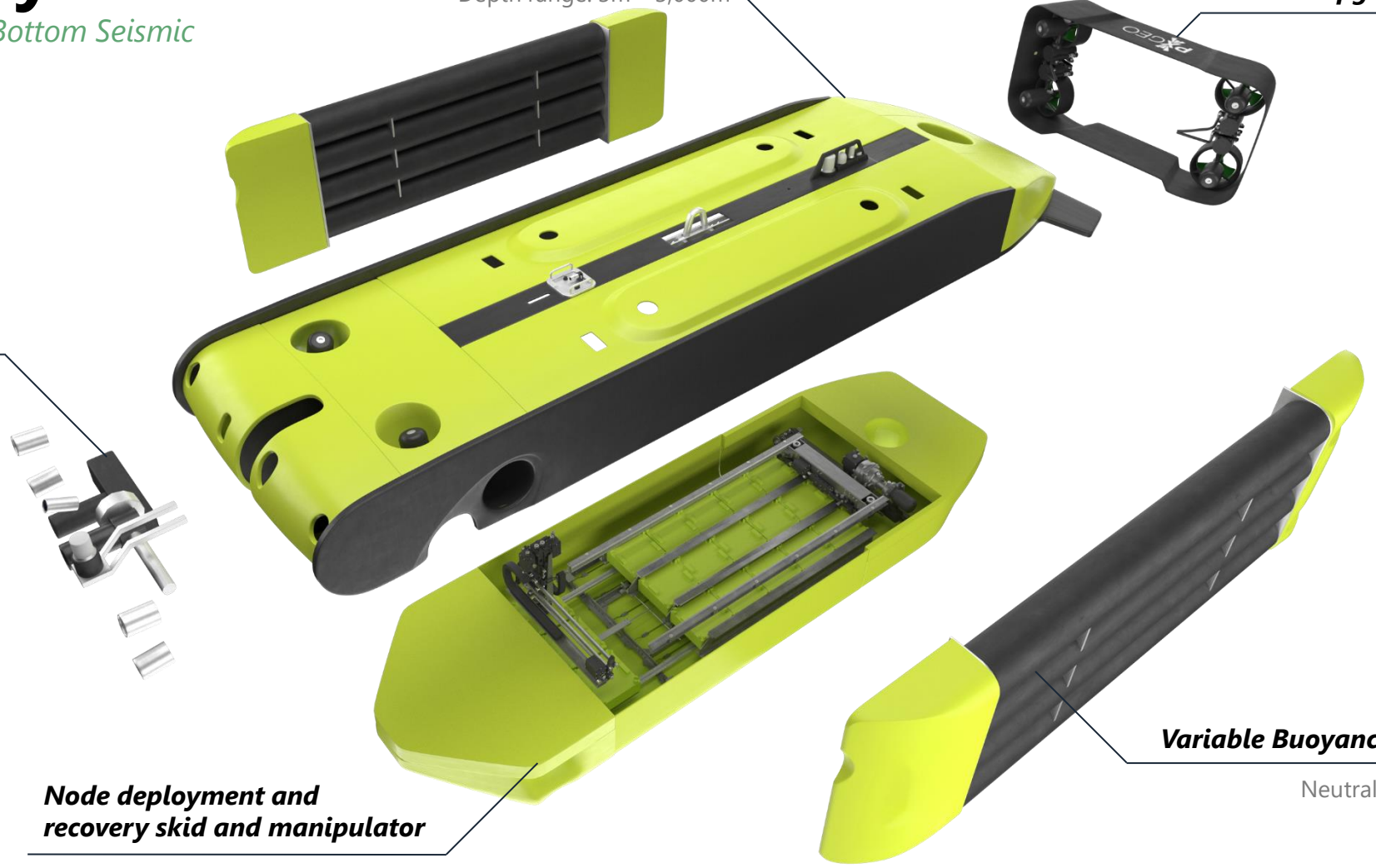
Depth range: 3m – 3,000m

Thruster upgrade package

4.5 knots

Navigation, shape recognition, and obstacle avoidance

Autonomous operations
machine vision and learning



Variable Buoyancy System

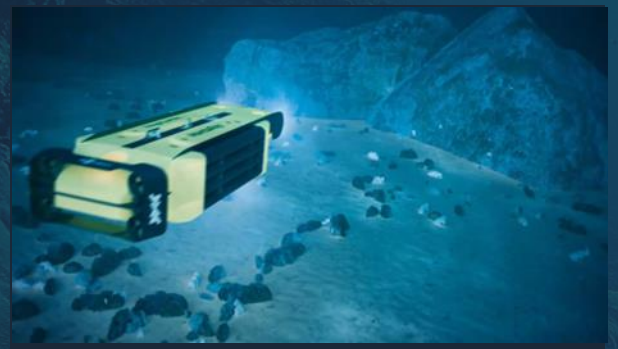
Neutrally buoyant

Node deployment and recovery skid and manipulator

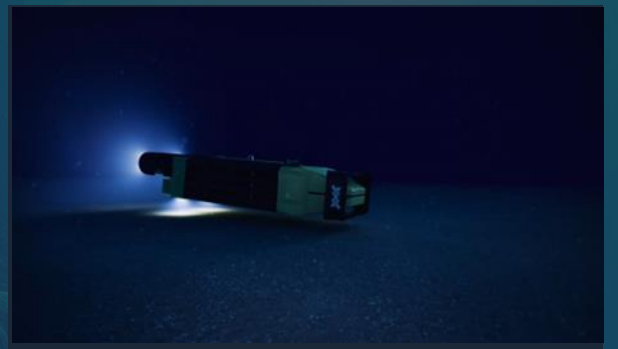
35 x Manta Nodes

Key elements of MantaRay

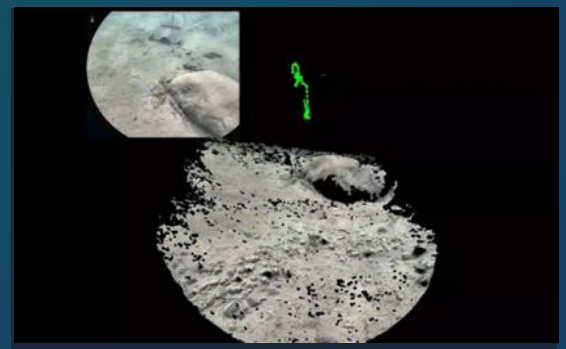
Safe Deployment of MantaRay and Garage



Controlled Movement



Controlled Node Deployment and Recovery

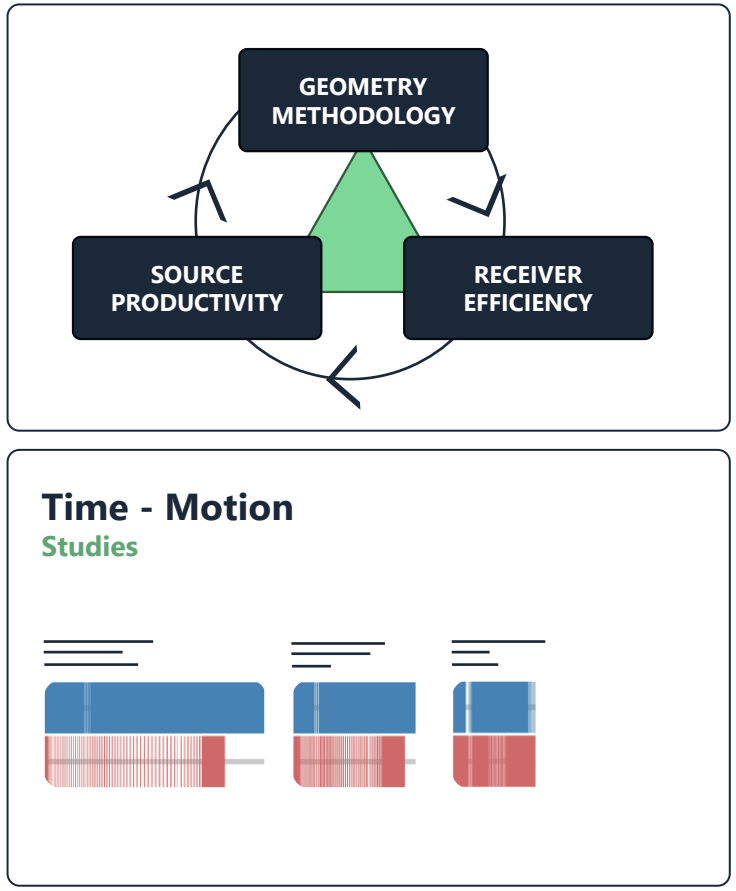


Shape Recognition Camera Technology

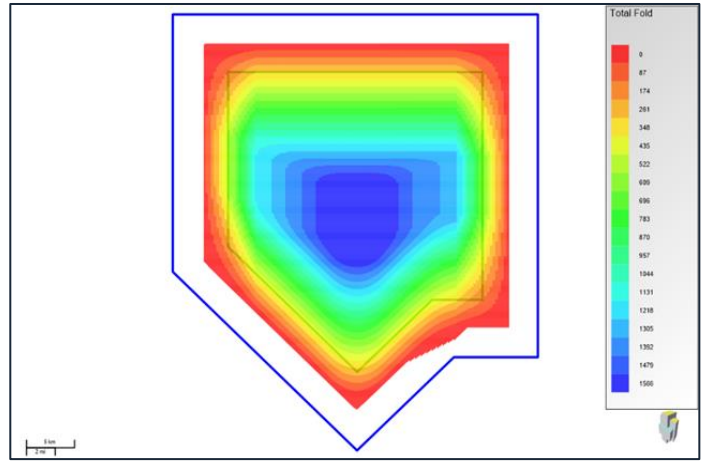
Survey Design Flexibility

MantaDesign™

Tool for survey prototyping and time-motion analysis



Interactive process with client to obtain optimal survey design



Survey design output

What would you do with a faster receiver resource?

Improved sampling and image quality within the same timeframe

Identical sampling within a reduced timeframe

Equivalent sampling within a reduced timeframe