

PURCHASE REVIEW · OCTOBER 1, 2026

MBARI New ASV

Selecting a Autonomous Surface Vehicle

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History



Current fleet is obsolete

We currently have 3 Wave Glider SV3-200s: obsolete, but still functional.



Maintainability at risk

We have some spare parts, but long-term maintainability is not guaranteed.



Not suited to every use case

Works for current users, but not suitable for some potential users (e.g., mapping).



Requirements gathered from labs

Collected needs from MBARI labs that currently use, or want to use, an ASV.



MBARI's current Wave Glider SV3-200

Requirements



Payload size, weight & power

90 × 30 × 30 cm (81 L), 30 kg,
120 W max, 2 kWh for payload



Duration

Up to 6 months; main usage
under 1 month



Range

Up to 160 nm; main usage under
20 nm



Data needs

A few labs need a high-speed link
(20 Mbps); most do not



Vehicle noise

As low as possible to support
highly sensitive sonar payloads



Deployments outside Moss Landing

Needed by some labs; platform
must ship easily



Self-operated by lab

Most prefer ops by ASO; some
want to drive themselves



Maneuverability & speed

Keep up with AUV/gliders; boat-
less dock launch; consistent
mapping speed



Event response

Rapid transit and high
maneuverability to respond to
events



Vendor relations

Low-level vehicle access needed
for some use cases



Ship operations

Deployment / recovery with RV
Paragon



Recommendation

To meet most of the requirements:
**electric propeller-driven
vehicle**

Payload Challenges



Water-property sensors

Most chemical and optical sensors (CTD, CO₂, fluorometer, etc.) work on any vehicle

ANY VEHICLE



Bioacoustics

Requires a low-noise vehicle and high pitch/roll stability

FAVORS WAVE GLIDER



Mapping

Requires maneuverability, consistent speed and enough battery power

PROP-DRIVEN ONLY



ESP

Large payload, likely doesn't fit the Wave Glider; needs 2 kWh of battery (more if cooling is necessary)

PROP-DRIVEN



Data relay

Requires consistent speed; Wave Glider can barely keep up with LRAUV and would not work for Dorado

PROP-DRIVEN



AUV intervention / deployment / recovery

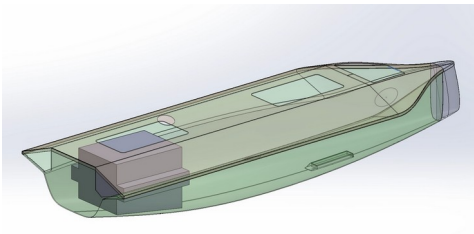
Needs towing capacity, high speed and high maneuverability

PROP-DRIVEN

 **Takeaway:** only bioacoustics favors the Wave Glider; most other payloads need a prop-driven vehicle

CHOICE 1

Seasats Lightfish



Hull concept (left) and Lightfish underway (top). Source: Seasats.

3.5 m Length	4.0 kWh Li-ion battery	4.5 kn Sprint speed	6 mo Endurance
Dimensions	3.5 × 1.0 m (11.4 × 3.4 ft); 0.8 m draft		
Weight	132 kg base, up to 181 kg fully loaded		
Payload	77 L bay, up to 30 kg		
Payload power	20-30 W steady; bursts to 300+ W		
Energy	4.0 kWh Li-ion battery + 415 W solar (opt. methanol generator)		
Speed	4.5 kn sprint / 2 kn cruise		
Range	~575 nm on battery alone; 6,000+ nm with solar		
Propulsion	Electric (Torqeedo, ~3 HP equiv.), weedless prop		
Comms	LTE, Iridium SBD/Certus; optional Starlink, MANET		
Vendor	Seasats (San Diego, CA)		

CHOICE 2 Open Ocean Robotics DataXplorer



Field assembly (left) and DataXplorer on the water (top). Source: Open Ocean Robotics.

3.7 m	3.5-17.5 kWh	6 kn	500 nm
Length	Battery options	Max speed	Range, max battery
Dimensions	3.7 × 0.9 m (12.2 × 2.9 ft); 0.5 m draft		
Weight	143 kg (std. battery) to 204 kg (max battery)		
Payload	Up to 50 kg		
Energy	3.5 kWh std., expandable to 17.5 kWh; 270 W solar		
Speed	2 kn cruise / 6 kn max		
Range	~100 nm on std. battery; up to 500 nm with max battery		
Propulsion	Electric, ~3 HP equivalent		
Hull	Patented self-righting design		
Comms	4G cellular, Iridium Certus-100, AIS Class B		
Vendor	Open Ocean Robotics (Victoria, BC)		

CHOICE 3 Liquid Robotics Wave Glider SV3-300



Photo: one of MBARI's current Wave Glider SV3-200s.



Wave-driven: not the recommended electric-propeller design

1 yr

Endurance

45 kg

Max payload

1 kn

Typical speed

4.5 kWh

Max battery

Dimensions	3.05 m float + 2.13 m sub, 4 m umbilical
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Weight	~150 kg (vehicle only)
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Payload	Up to 45 kg / 93 L; up to 7 modular bays
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Payload power	5-20 W average; 360 W peak
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Energy	0.9-4.5 kWh battery + 150 W solar
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Speed	~0.8 - 1 kn typical / 3 kn max
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Endurance	Up to 1 year at sea
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Propulsion	Wave-powered fins + electric thruster backup
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Comms	Iridium 9602/RUDICS, cellular option, WiFi, Starlink
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Vendor	Liquid Robotics / Boeing (Sunnyvale, CA)
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Comparison of Vehicles

	Seasats Lightfish	Open Ocean DataXplorer	Liquid Robotics Wave Glider SV3
Length	3.5 m	3.7 m	3.05 m float + 2.13 m sub
Weight	132-181 kg	143-204 kg	~150 kg
Payload	77 L / up to 30 kg	Up to 50 kg	Up to 45 kg / 93 L
Energy storage	4.0 kWh + 415 W solar	3.5-17.5 kWh + 270 W solar	0.9-4.5 kWh + 150 W solar
Speed	4.5 kn sprint / 2 kn cruise	6 kn max / 2 kn cruise	3 kn max / 0.8 - 1 kn typical
Range / endurance	~575 nm battery; 6,000+ nm w/ solar	~100 nm std.; 500 nm max battery	Up to 1 year at sea
Propulsion	Electric propeller	Electric propeller	Wave energy + electric backup
Data link	LTE, Iridium SBD/Certus, Starlink	4G, Iridium Certus-100	Iridium 9602, cellular, WiFi, Starlink
Rough cost	~\$300K	~\$300K	~\$300K
Electric propeller (recommended)	✓ Yes	✓ Yes	✗ No (wave-driven)

Requirements & Feature Matrix

	Seasats Lightfish	Open Ocean DataXplorer	Wave Glider SV3
Maneuverability & speed Station keeping, mapping lines	MEETS Electric propeller; no issues noted	MEETS Electric propeller; no issues noted	FAILS Speed not consistent; can't station keep or run mapping lines
Low noise Sensitive sonar payloads	RISK Possibly fails; unknown until payload is integrated	RISK Possibly fails; unknown until payload is integrated	MEETS Quiet, wave-driven platform
Payload bay Must fit the ESP	STRONG Large, open payload bay	ADEQUATE Somewhat restricted, but large enough for ESP	WEAK Small bay; likely can't fit the ESP
Data & user interface Science data, command & control	GOOD Good data and user interface	STRONG Very sophisticated data and user interface	WEAK Hard science data download; poor C2 user experience
Vendor support Low-level access & modifications	STRONG Very strong support for low-level vehicle access	ADEQUATE Some openness to low-level access	WEAK Little support beyond what we already do
Event response Rapid transit to events	MEETS High speed and agility	MEETS High speed and agility	FAILS ~1 kn typical; slow to reach events, hard to use for intervention
Stability Roll / platform stability	MODERATE Keel improves stability	WEAK Least roll stability of the three	STRONG Best stability (glider design)

Thank you!

Questions?

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