



SPACE OCEAN

SATELLITE INFRASTRUCTURE

\$200,000 to \$2 M for Satellites & Engineering Services



Government Initiatives

Commercial Demand



Paul S Mamakos, CEO

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Leadership and Team



Paul Mamakos
Founder – CEO



Pete Freeland
President & CTO



Cliff Silver
CFO



Susan Siros
CHRO



Damon Bradley
Chief Scientist



Dennis Helmer
Director of Engineering

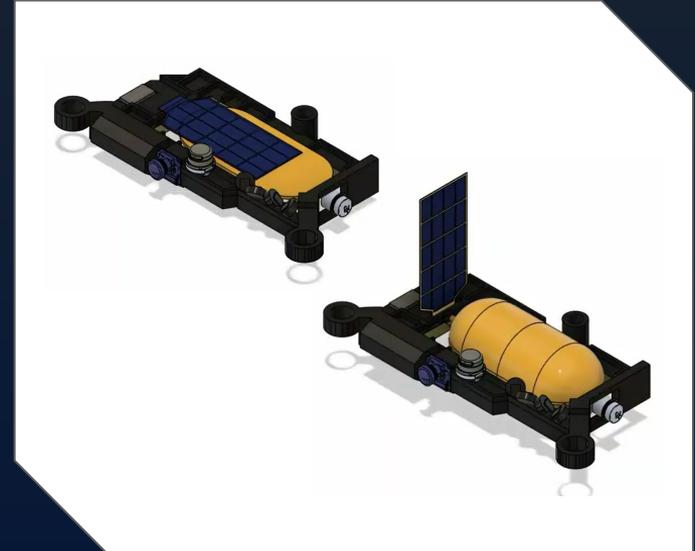


Kathi Wright
CMO



Dr. Alberto Vasquez
Chairman of Board

Supplying Water in Space



Affordable, Reusable Satellites for On-Orbit Fluid Deliveries: free up launch capacity, reduce crew workload, lower cost, and enable flexible, on-demand access to water and other fluids essential for long-duration space missions.



10 Satellites for \$125,000

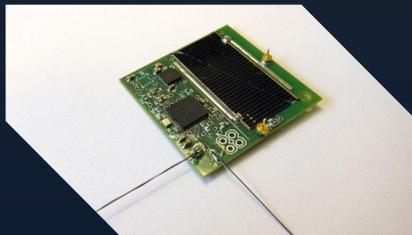
Hardware

3x \$100–\$500

Transmit and

Receive

Is all we need



Problem / Solution

SO needs a relevant launch with minimum expense

ISAM community needs to convince spectrum regulators to allow for “unschedule unapproved” ISAM

SO just needs to do a ‘dry run’ of the communications for an ISAM /Tetraodon delivery (with no delivery) to help with both

Mission

Hardware in the Loop Exercise

1. 2-3 Satellites that just send or receive radio comms at the right times with the right protocols
2. 2 groups of regular SDA folks and a “blind” trial group that don’t know when or where ahead of time.
3. We just have our satellites and our rented operations center call the right people at the right times.

Stakeholders

FCC & ITU

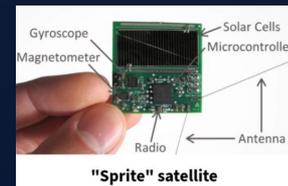
CONFERS

COSMIC

Space Force and AF Materiel Command

Colleges, namely Cornell and Kicksat team

GSAS and OCAS providers



10 Sprite Satellite DEMO

In-Space Servicing, Assembly, and Manufacturing: on-orbit space operations, including repairing, refueling, and building structures in space, with "ISAM Comms" specifically relating to the crucial communications and regulatory frameworks (like the FCC's) needed for these missions, enabling services like satellite life extension and new space infrastructure.

The Product Is **Water** By the Liter



Key Takeaways

- **Revenue:** \$81M → \$1.377B (2028–2030)
- **EBITDA:** \$27M → \$820M (3,020% increase)
- **Operational Efficiency:** Operating expenses shrink from 17.1% to 1.2% of revenue.
- **Scalable Model:** Strong unit economics, improving margins, and early profitability.



Revenue Streams



Scheduled Water Delivery - Long-term contracts with space agencies and commercial operators



Emergency Supply Services - Premium pricing for urgent water delivery



Infrastructure Licensing - Technology licensing for on-site storage and distribution

Sale Price: \$45,000 to \$100,000 per Liter

Cost: \$20,000 per Liter

Volume: 150 to 1,000 Liters per Delivery

Revenue: \$15 Million to \$90 Million per Delivery



Revenue Growth (2028–2030)

- **2028 (Year 1):** \$81M
- **2029 (Year 2):** \$769.5M
- **2030 (Year 3):** \$1.377B
- **Total Growth:** 1,700% over 3 years

Revenue grows from \$81M to \$1.377B, showing strong scalability.

Gross Margins

- **2028:** 50.6% (\$41M gross profit / \$81M revenue)
- **2029:** 53.2% (\$409.5M / \$769.5M)
- **2030:** 60.8% (\$837M / \$1.377B)

Margins improve by +10.2 percentage points, showing efficiency and economies of scale.

Profitability (EBITDA)

- **2028:** \$27.2M (33.5% margin)
- **2029:** \$393.1M (51.1% margin)
- **2030:** \$820.6M (59.6% margin)

The company is profitable from Year 1, with EBITDA margins approaching 60% by Year 3.

Major Expenses

2028 (Year 1):

- Cost of Sales: \$40.0M (49.4%)
- Product Development: \$11.0M (13.6%)
- General & Admin: \$1.47M (1.8%)
- Sales & Marketing: \$1.33M (1.6%)

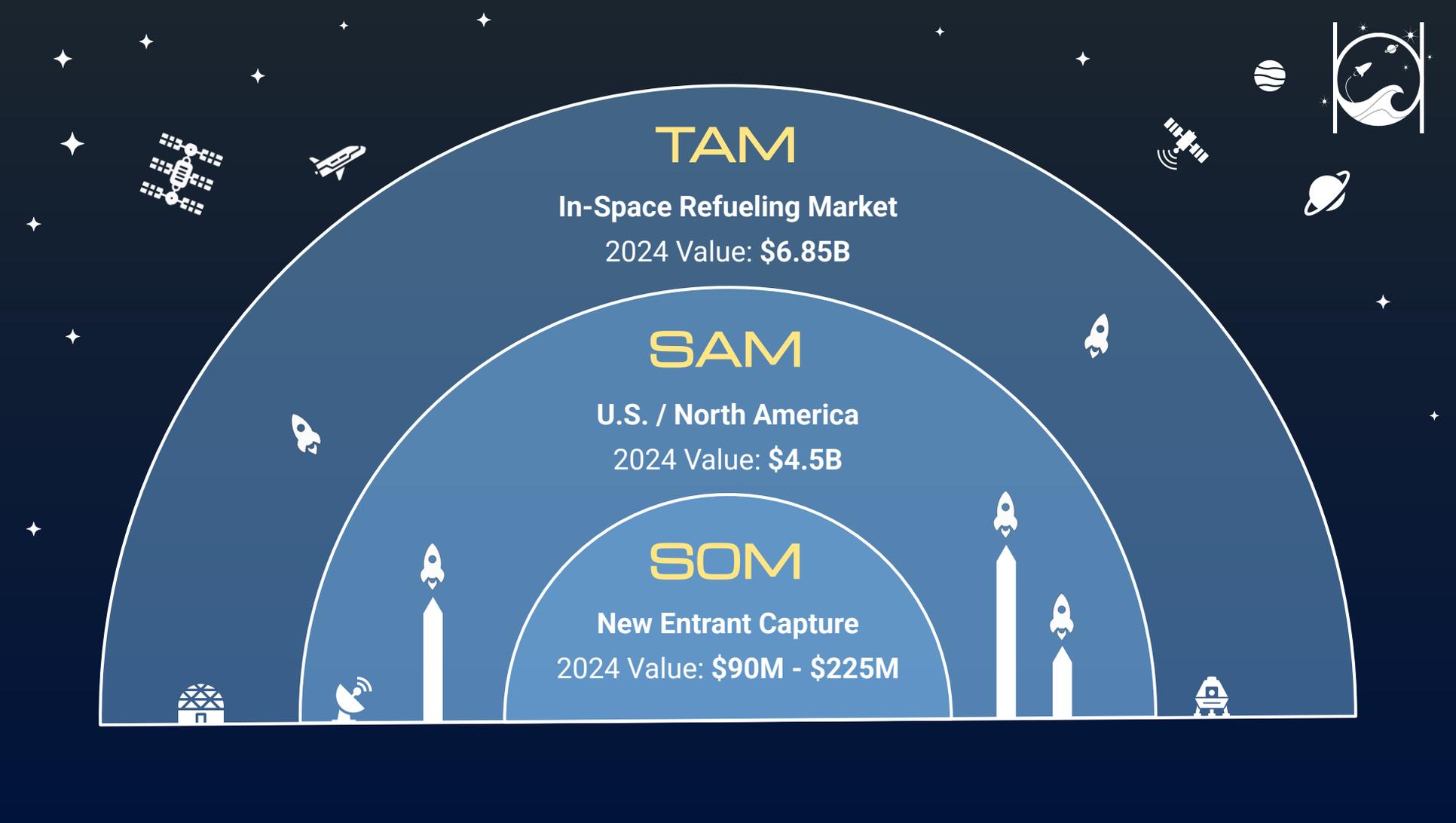
2029 (Year 2):

- Cost of Sales: \$360.0M (46.8%)
- Product Development: \$12.5M (1.6%)
- General & Admin: \$1.47M (0.2%)
- Sales & Marketing: \$1.34M (0.2%)

2030 (Year 3):

- Cost of Sales: \$540.0M (39.2%)
- Product Development: \$13.6M (1.0%)
- General & Admin: \$1.47M (0.1%)
- Sales & Marketing: \$1.33M (0.1%)

Product Development is the largest operating expense, representing ~83% of operating costs in 2030.



The infographic features three concentric semi-circular arcs on a dark blue background with white stars. The outermost arc is labeled 'TAM' and contains icons of a satellite, a rocket, a planet, and a satellite dish. The middle arc is labeled 'SAM' and contains icons of two rockets. The innermost arc is labeled 'SOM' and contains icons of a rocket, a satellite dish, a rocket, and a small rover. The text is centered within each arc.

TAM

In-Space Refueling Market

2024 Value: **\$6.85B**

SAM

U.S. / North America

2024 Value: **\$4.5B**

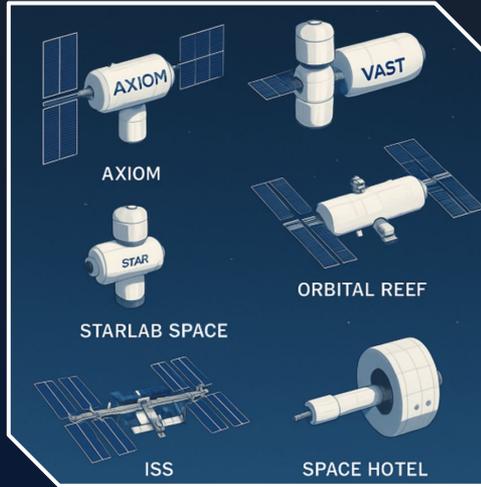
SOM

New Entrant Capture

2024 Value: **\$90M - \$225M**

The Customer

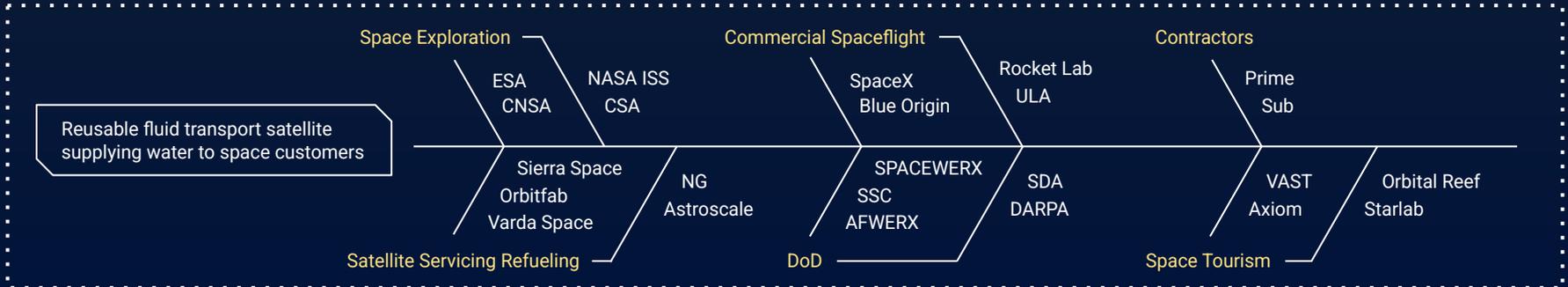
Four Commercial Space Stations



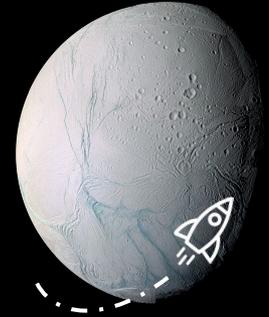
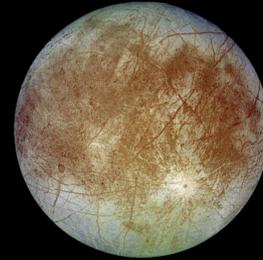
Potential Customers:
Haven-1 (2026) and Haven-2 (2028)
by VAST Space



Touring VAST Haven-1 Module:
Pete Freeland, President, CTO,
and Paul S Mamakos, CEO



Water and Fluid Logistics



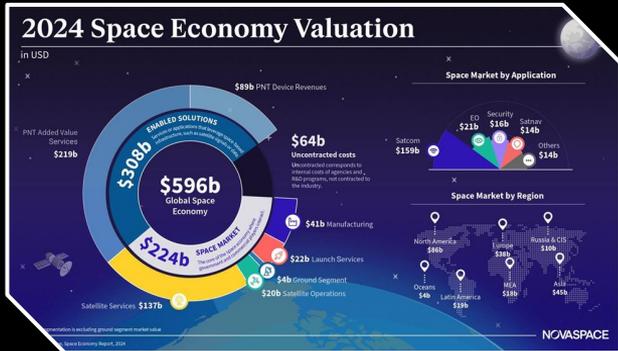
Earth
LEO/MEO/GEO

Moon

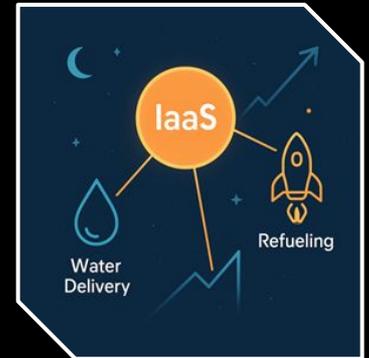
Asteroid
Belt

Europa

Enceladus



\$1T Space Economy by 2034 



Expensive Problems We Solve:



1. **Launch Cost Variability:** High and unpredictable launch costs, driven by fuel prices and rocket availability, strain budgets for satellite deployments and missions.
2. **Orbital Debris Management:** The growing threat of space junk increases the risk of collisions, requiring costly mitigation strategies like deorbiting services or insurance.
3. **In-Orbit Satellite Maintenance:** Lack of reliable repair or refueling options for satellites leads to early replacements, driving up expenses for investors.
4. **Regulatory Hurdles:** Complex international space laws and spectrum allocation issues delay projects and inflate compliance costs.
5. **Scalability of Space Tourism:** Developing affordable, safe, and repeatable space tourism infrastructure remains a costly challenge with uncertain returns.

Development Status & Roadmap



Completed TRL 3 – Validated in Simulation

Concept validated via modeling & simulation. Feasibility established. Foundational structure and performance demonstrated analytically. System Requirements Review – System Design Review



Current: TRL 4 / 5 – Benchtop Prototypes & Airborne Campaign Development

Testing of benchtop prototypes to validate subsystems in laboratory settings. \$95,000 of specialized software is required to reach Preliminary Design Review (PDR) by the end of 2025. A brief parabolic flight airborne campaign will follow to demonstrate key subsystems in a relevant environment, marking a critical risk-reduction phase.



Next Milestone: TRL 6 / 7 – LEO Demonstration Mission (2027)

Fabrication and integration of full-scale prototypes (\$10 million), followed by securing launch commitments (\$5 million) at least 18 months in advance. The total program requirement is \$70 million to complete build, testing, and launch. The LEO demonstration mission will validate end-to-end system performance and accuracy goals in the operational space environment, building directly on ground and airborne lessons learned.



Goal: TRL 9 – Operational Capability (2028)

Successful LEO demonstration will enable maturation towards scalable operations, deployment, and expansion of capabilities across multiple missions.

Space Ocean Corp is executing this phased approach to mature its technology rapidly, reliably, and on schedule for a 2027 launch.

Competitive Advantage



Characteristics of Space Station Cargo Delivery Vehicles

Vehicle	Operator	Status	Cargo Types	Fluid Transport Capacity	Mission Period	Cost
SpaceX Dragon	SpaceX (USA)	Operational	Pressurized, Unpressurized, Downmass	~840 kg (water, gases)	2012–Present	\$300 Million
Cygnus	Northrop Grumman (USA)	Operational	Pressurized, Waste Disposal	~200 kg (water, gases)	2014–Present	\$250 Million
Progress	Roscosmos (Russia)	Operational	Pressurized Propellant Waste	~1,540 kg (fuel, water, gases)	2000–Present	\$150 Million
Space Ocean Tetraodon	Space Ocean (USA)	In Development	Unpressurized, No Astronauts	~1,500 kg	2027–	\$70 Million
Dream Chaser	Sierra Space (USA)	In Development	Pressurized, Unpressurized, Downmass	~5,500 kg	Post-2025	\$1-\$2 Billion
HTV-X	JAXA (Japan)	In Development	Pressurized, Unpressurized, Waste Disposal	TBD (~300 kg est.)	2025–Future	\$220 Million



Space Ocean Financial Projections - Use of Initial Funds

In \$Millions

NON-RECURRING ENGINEERING	\$15.0
FLIGHT UNITS (2)	12.0
COMPENSATION & BENEFITS (1 YEAR)	10.8
ENGINEERING DEVELOPMENT UNIT	6.5
LAUNCH COSTS	6.5
QUALIFICATION UNIT	6.0
TOOLING & MFG SETUP	3.0
IT SYSTEMS INCL. LAPTOPS	1.0
CORPORATE OFFICES	1.0
TRAINING	0.5
EXPO MOCKUP	0.5
SOFTWARE	0.3
ALL OTHER & CONTINGENCY	6.9

Financial Forecast Highlights



Revenue grows by 1,700% over three years, reaching \$1.38B in Year 3



Gross profit margin improves from 51% to 61%, demonstrating increasing efficiency



Operating expenses remain stable while revenue scales, creating significant operational leverage

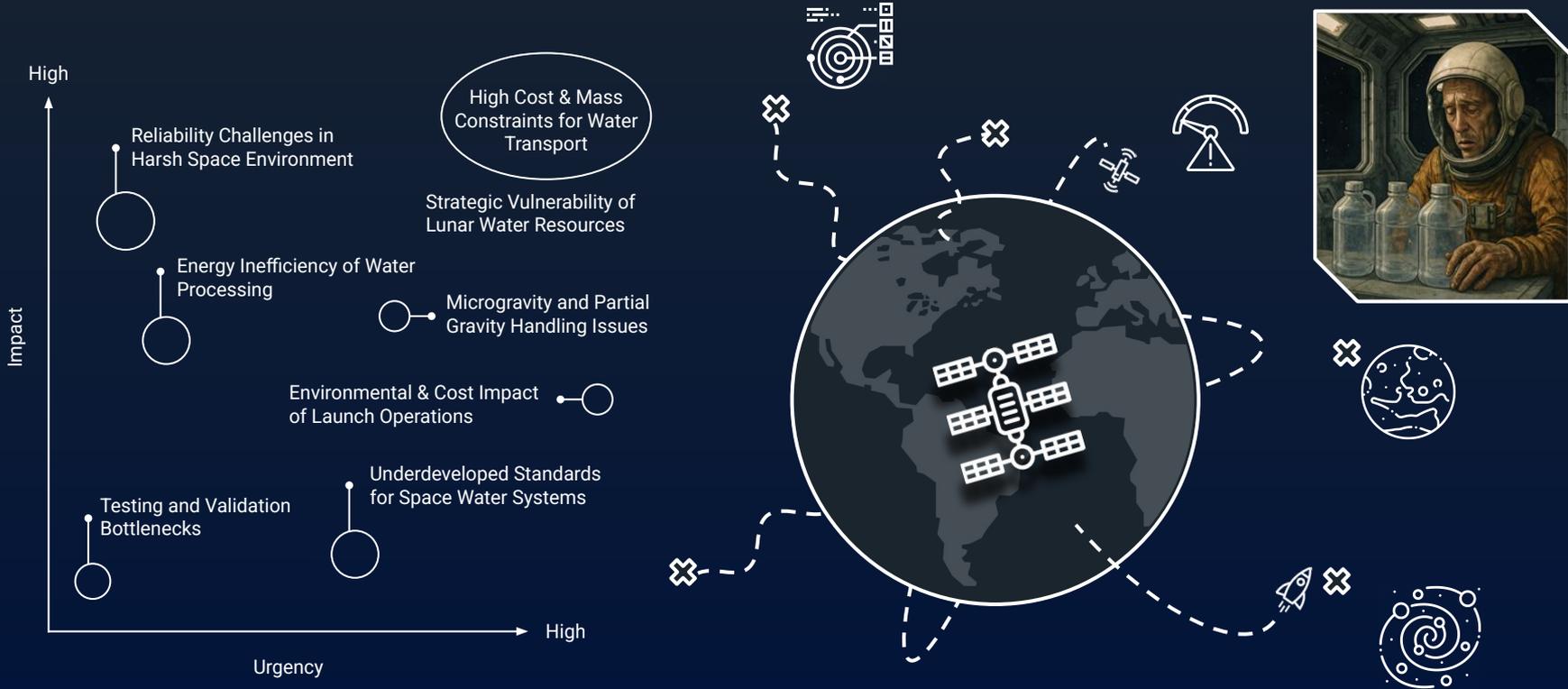


EBITDA grows by 3,020% to \$820.6M, with margin expanding from 33.5% to 59.6%

Investment Opportunity

This financial forecast demonstrates exceptional growth potential with improving margins and operational efficiency, making this SBIR project an attractive investment opportunity.

Water is scarce in space and the need is increasing with commercial space stations



Who and What is Space Ocean?



Space Ocean Corp is revolutionizing water management in the space industry by addressing three critical challenges:

✔ Water Quality Mandate

Water in space is governed by strict regulations and health imperatives, including NASA's Spacecraft Water Exposure Guidelines (SWEGs).

↻ Recurring Demand

Constant demand for water consumption, hygiene, and life support systems creates an ongoing operational requirement.

⚠ Operationally Painful

Current solutions involve exorbitant resupply costs, complex recycling systems, and significant crew time investment.



Our innovative water supply technologies significantly **reduce costs**, **enhance mission capabilities**, and **enable deeper space exploration science**.

Manual Water Transfer:

Astronauts spend **hours** hand-carrying and stowing water bags into cramped storage lockers.



Astronaut Chris Hadfield shows an example of water delivery in bags to the ISS.
(Canadian Space Agency YouTube channel)

The Problem: Operationally Painful



Current methods of providing and managing water in space are fraught with operational pain points, making it one of the most challenging aspects of space logistics.



Exorbitant Resupply Costs

A single liter of water can cost thousands of dollars to deliver to orbit, significantly impacting mission budgets.



Mass and Volume Constraints

Water's density directly impacts payload capacity, limiting scientific equipment and supplies that can be transported.



Recycling Efficiency Limitations

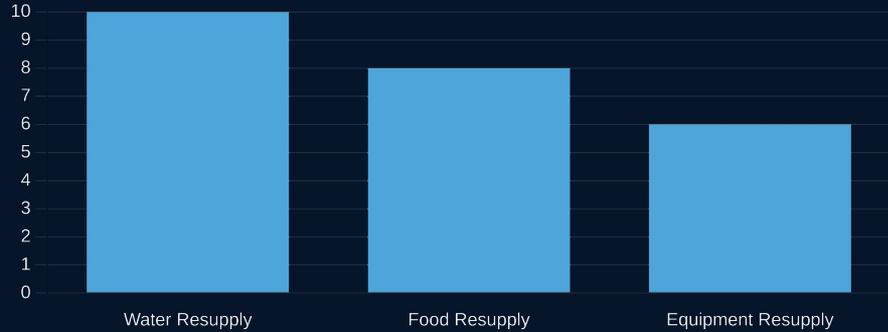
Even with 98% recovery rates, the remaining unrecoverable water necessitates periodic resupply.



Significant Crew Time Investment

Astronauts dedicate valuable time to water management tasks, diverting attention from mission-critical activities.

Relative Cost of Resupply Categories

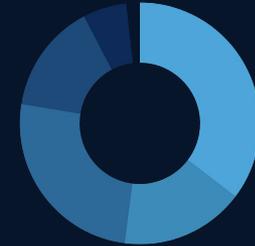


The Problem: Recurring Demands



Unlike Earth, every drop of water in space must be meticulously managed and conserved. The demand is constant and recurring, driven by fundamental human needs and spacecraft operations.

Daily Water Usage Distribution (%)



■ Drinking ■ Food Preparation ■ Hygiene ■ Oxygen Generation
■ Other Systems

Daily Consumption

Each astronaut requires approximately **one gallon of water per day** for drinking and food preparation.

Hygiene and Sanitation

Water is indispensable for personal hygiene, including brushing teeth and cleaning, essential for crew well-being.

Life Support Systems

Water plays a vital role in various life support systems, such as oxygen generation through electrolysis and thermal management.



The Problem: Mandated Requirements



Water quality and availability in space are subject to rigorous mandates established by space agencies to protect astronaut health and ensure mission success.

Spacecraft Water Exposure Guidelines (SWEGs)

NASA has developed comprehensive guidelines for numerous chemical compounds that could potentially contaminate water systems.

These guidelines dictate permissible concentrations for various exposure durations (1, 10, 100, and 1,000 days).

Health and Safety Imperatives

Contaminated water can lead to gastrointestinal issues, dehydration, and infections—all amplified in the isolated environment of space.

The closed-loop nature of spacecraft environments means that even minor contaminants can accumulate and pose significant long-term threats.

"Any deviation from these strict standards can lead to severe health risks for the crew, compromising mission objectives and potentially endangering lives."

Chemical	SWEGs (Spacecraft Water Exposure Guidelines) POTENTIAL EFFECTS			
	1 day		10 day:	
 Acetone CAS #: 67-64-1 Reference: Garcia, Hector D. (2007), Acetone, Spacecraft Water Exposure Guidelines for Selected Contaminants, Vol. 2: 11-38. The National Academies Press, Washington, DC.	3500 mg/L		3500 mg	
	<u>Organ</u>	<u>Effect</u>	<u>Organ</u>	<u>Effect</u>
	Blood	Marrow Hypoplasia	Blood	Marrow Hypoplasia
Alkylamines (di) CAS #: Variable Reference: Hampton, Jean M. (2007), C1-C4 Mono-, Di-, and Trialkylamines, Spacecraft Water Exposure Guidelines for Selected Contaminants, Vol. 2: 96-153. The National Academies Press, Washington, DC.	0.3 mg/L		0.3 mg/L	
	<u>Organ</u>	<u>Effect</u>	<u>Organ</u>	<u>Effect</u>
	Nose	RWC	Nose	RWC

Delivering
Water On
Orbit

We solve
for Launch
Costs

Lead
Times



CEO, President, Engineering Director
Visiting a Launch Provider, June 2025



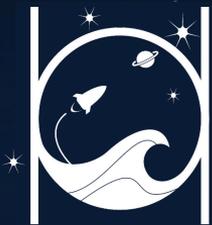
Launch Schedule



●	2027	First Demonstration Flight	Rideshare	Launch with 2 transport modules
●	2028	Second Demonstration Flight	Rideshare	Launch with ALVS and 2-4 transport modules
●	2028	First Commercial Flight	Rideshare	Launch with ALVS and 8-10 transport modules
●	2029	Second Commercial Flight	Rideshare	Launch with ALVS and 8-10 transport modules
●	2029	Third Demonstration Flight	Dedicated	ALVN with 8-10 transport modules
●	2030	Third Commercial Flight	Dedicated	ALVN with 8-10 transport modules
●	2030	Fourth Commercial Flight	Dedicated	ALVN with 8-10 transport modules
●	2031	Fifth Commercial Flight	Rideshare	Launch with ALVS and 8-10 transport modules
●	2031	Sixth Commercial Flight	Dedicated	ALVN with 8-10 transport modules
●	2032	Seventh Commercial Flight	Dedicated	ALVN with 8-10 transport modules

Team can support launches from all 3 main locations (KSC, VAFB, or Starbase) but preference if available is Starbase

Team can support launches with transport modules on one flight vehicle and ALV units on another if within 3-4 months



SPACE OCEAN CORP

Pioneering Sustainable Space Logistics and Water Infrastructure

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