



**A Q U A**



**B O T I X**



# LEADING THE WAY IN THE EMERGING UNDERWATER DRONE MARKET

Focusing on micro-sized, swarming products for a broad range of defence applications where urgent requirements exist.

- Providing innovative, autonomous solutions for the notoriously challenging shallow water and surf zone environments.
- Swarm capability allows single operators to interact with multiple vehicles as a coordinated entity.
- SwarmDiver™ is the first of its kind: a micro-sized, hybrid unmanned surface and underwater vehicle. This flexible system is highly versatile and has dozens of uses.



*Swarm of approximately 30 Aquabotix's  
SwarmDiver™ product encircling a vessel.*

# DEMONSTRABLE SUCCESS



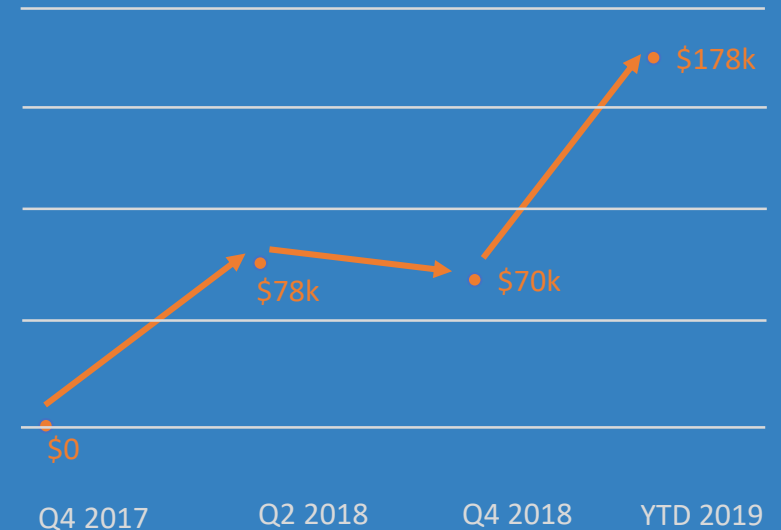
\*Necessarily, not all (and there can be no assurance that any) of these sales opportunities will result in sales.

\*\* Based on MarketsandMarkets data in Report Code AS 2327

# SOLID ACQUISITION ACTIVITY TREND

- Aquabotix recently secured its 4<sup>th</sup> U.S. Military-funded contract related to SwarmDiver™ in the single year since the product's launch
- U.S. Military procurement activities are oftentimes followed by other nation's navies as products are qualified for use
- The value of awards to Aquabotix is substantially increasing over time
- Initial sales represent meaningful and necessary steps towards full operational use of the SwarmDiver™

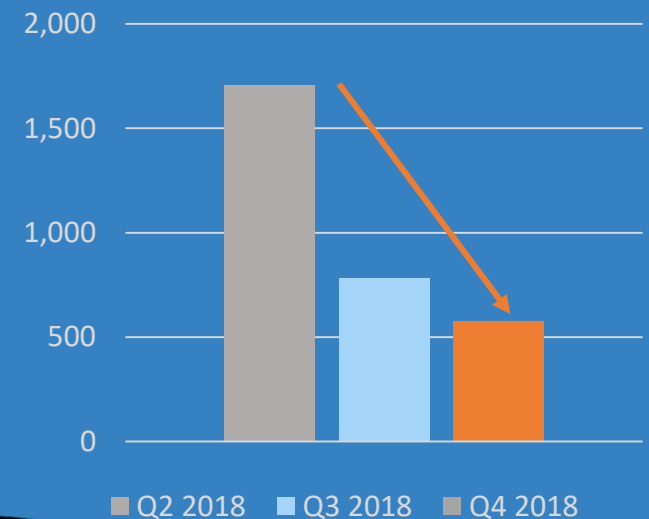
U.S. MILITARY-FUNDED CONTRACTS  
FOR SWARMDIVER



# RESULTS OF STRATEGIC SHIFT

- Notable progress on cash inflows and increased non-dilutive, customer-funded development activity
- Reduced market pressure from competition as the Company is focusing on areas where few, if any, commercially viable alternatives exist
- Expedited awards as products are designed to meet urgent, unfulfilled or inadequately-fulfilled needs
- Significantly reduced cash burn
- Secured key partnerships and executed cooperative agreements

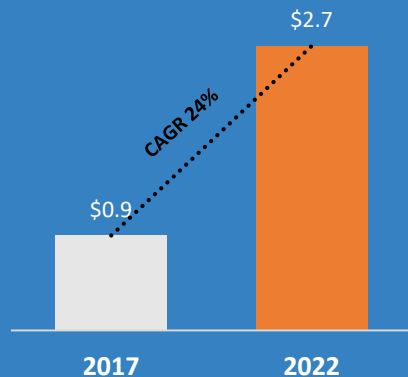
NET CASH USED IN OPERATIONS  
(\$1,000s)



**Global unmanned underwater vehicle market projected to be**

**US\$5.2 billion**

**by 2022**



**Autonomous unmanned vehicles sub-category is forecast to grow at a CAGR of 24% from 2017 to 2022**

**U.S. Navy and Marines estimated spend for drones exceeds**

**US\$3.7 billion**

**in Gov't FY 2019**

**U.S. Defence projected spend for autonomy, teaming, and swarms nearly**

**US\$0.9 billion**

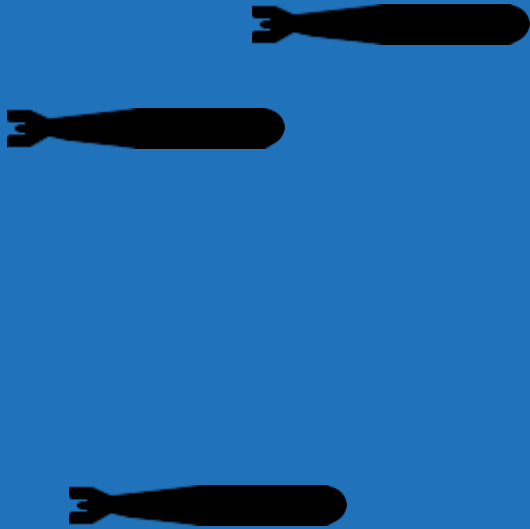
**in Gov't FY 2019**

**MARKET OPPORTUNITY**

Budget summary data from <https://dronecenter.bard.edu/files/2018/04/CSD-Drone-Spending-FY19-Web-1.pdf>;

Market growth estimates from <https://www.marketsandmarkets.com/PressReleases/swarm-intelligence.asp> and Markets and Markets Report Code AS 2327

# APPENDICES





*Click icon above for an overview of SwarmDiver™'s distinguishing capabilities and exclusive footage from an actual demonstration of the product to U.S. military personnel.*





# MARKET INFORMATION



**Global unmanned underwater vehicle  
market projected to be**

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**Global swarm intelligence market  
for drones is expected to grow at a**

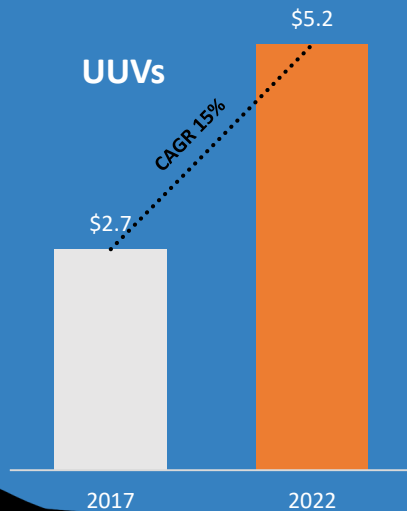
**CAGR of 69%**  
**from 2020 to 2030**

**MARKET OPPORTUNITY**

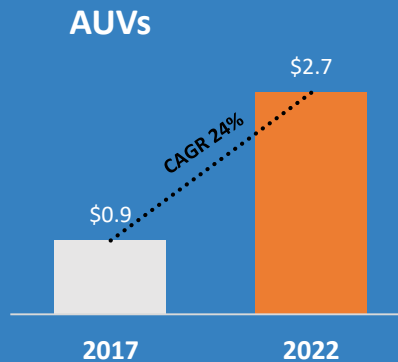
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The unmanned underwater vehicle (UUV) market is forecast to grow from US\$2.7 billion in 2017 to **US\$5.2 billion in 2022**



Autonomous unmanned vehicles (AUV) sub-category is forecast to grow from US\$0.9 billion in 2017 to **US\$2.7 billion by 2022 at a CAGR of 24%**



The Swarm Intelligence Market was estimated to grow to **US\$450 million by 2030, at a CAGR of 40%** from 2020 to 2030; and

The broader Artificial Intelligence (AI) Market to be worth **US\$190 Billion by 2025.**

Significant growth projected in swarm intelligence and AI



# GROWTH

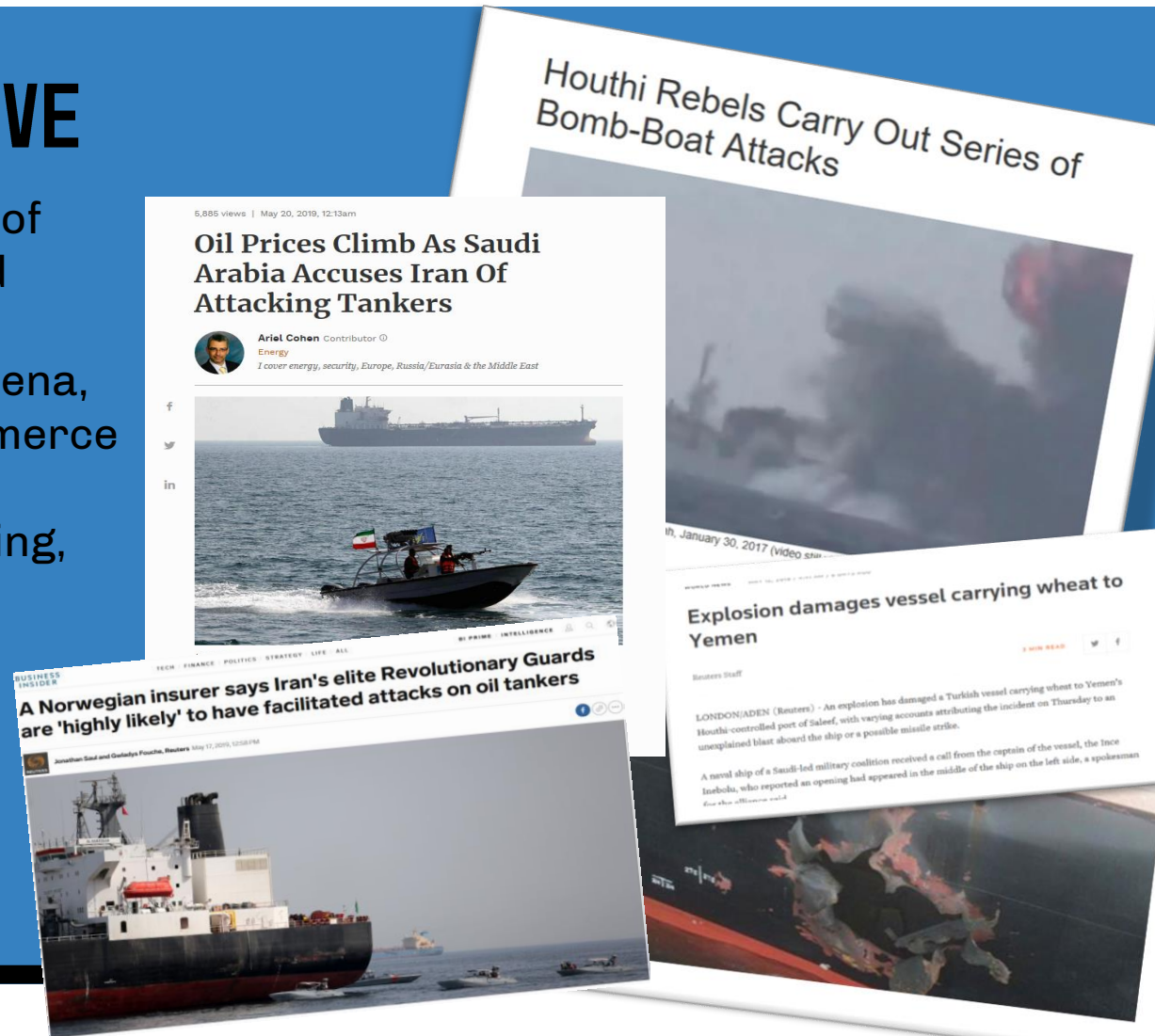
Several high-value M&A transactions have closed, including:

- General Dynamics acquired BlueFin Robotics, a manufacturer of large-bodied unmanned vehicles, in February 2016;
- Boeing acquired Liquid Robotics, maker of a wave and solar-powered autonomous robot, in December 2016, reportedly for a consideration in the hundreds of millions of dollars;
- L3 Technologies acquired OceanServer Technology, a Massachusetts-based manufacturer of autonomous unmanned undersea vehicles, in April 2017; and
- L3 Technologies acquired Open Water Power, a Massachusetts-based company that develops high-density aluminium batteries for unmanned undersea vehicles, in May 2017.

# CHALLENGES WE SOLVE

Over the past 5 years, the threat of improvised explosive devices and drone boat attacks have become common place in the maritime arena, putting at risk international commerce and oil supplies and creating an urgent need for locating, identifying, and neutralising those threats.

Variants of SwarmDiver™ can be used to effectively and cost-efficiently counter these persistent and growing threats.



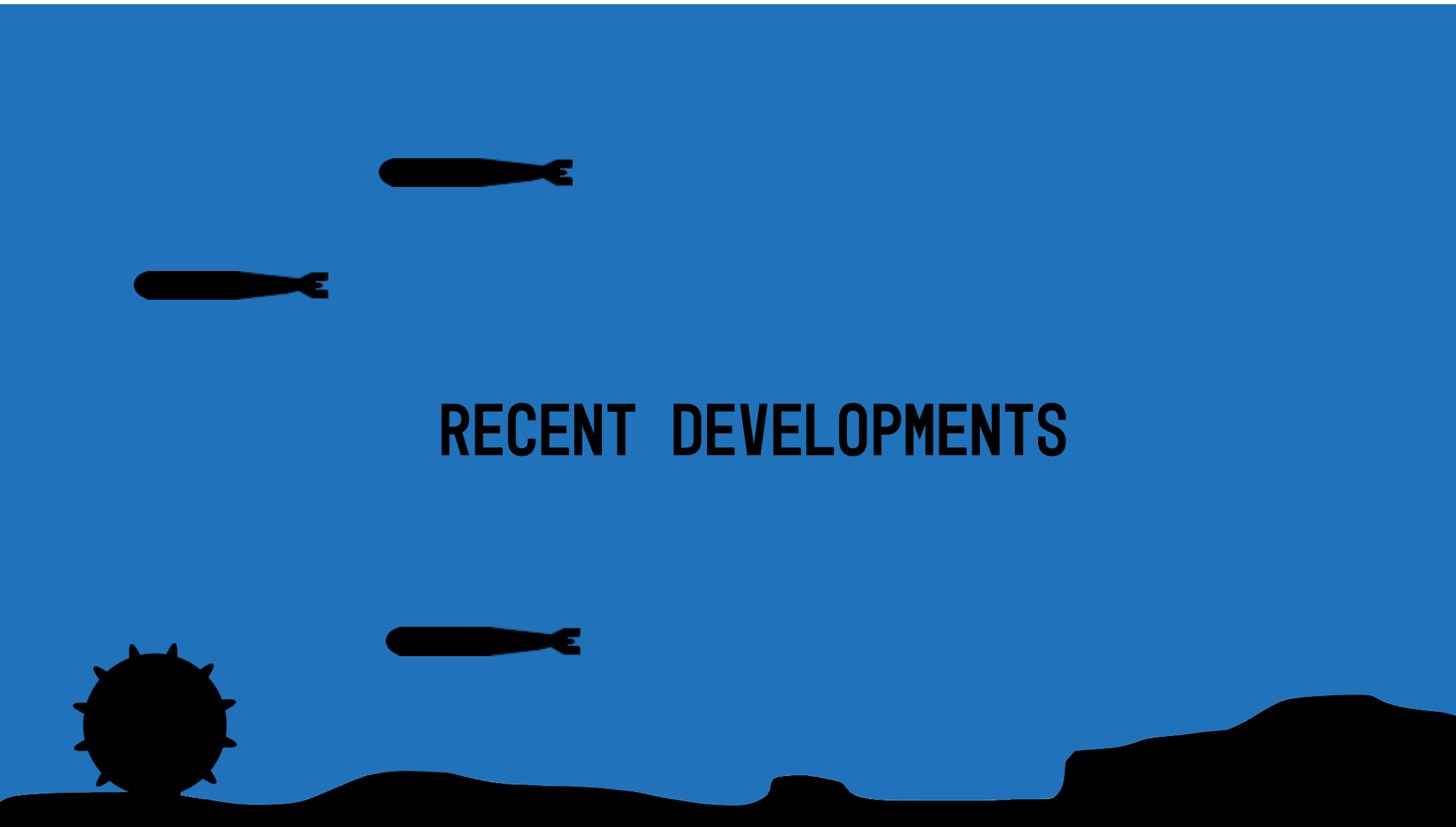
# MARKET UPDATE

- U.S. Military is taking measures to increase the speed of acquisition for urgent, out-of-cycle requirements to support its forces, including increased funding allocations for the Navy's rapid prototyping programs to field capabilities quickly.
- A long string of strikes by Houthi rebels on vessels transiting the Red Sea, a crucial global maritime lane, using anti-ship cruise missiles, explosive-laden remotely operated boats, and improvised weapons have created a more urgent need for advanced naval defence systems globally and demonstrated the need for the specific unmanned underwater vehicles/unmanned surface vehicles for mine countermeasure operations.
- April 2018, U.S. Navy leadership publicly announced that it is embracing unmanned systems for future combat, stating these technologies are "absolutely intrinsic to how we're going forward" in the Navy and Marine Corps during a panel discussion at the Navy League's annual Sea-Air-Space conference.
- The U.S. Navy commitment to the further development of underwater drones is evidenced by its recent contract award to Raytheon of a US\$83 million base value contract, with options up to US\$363 million to develop an autonomous underwater vehicle for the US Navy to use in the detection and mitigation of sea mines. The U.S. Navy also sought a vehicle that could operate in shallow waters and be an expendable modular neutraliser with a kill mechanism, propulsion and sensors.

# MARKET UPDATE

- In November 2018, Maj. Gen. David Coffman, Director of Expeditionary Warfare for the U.S. Navy stated that the Navy is focusing on developing sensors and effects that are applicable to mine warfare that can be mixed and matched with various manned or unmanned offboard vehicles, rather than relying so heavily on littoral combat ships for these missions.
- In October 2018, the U.S. Naval Sea Systems Command received Pentagon approval to develop a mine countermeasure unmanned surface vehicle as part of the Navy's ongoing effort to replace its aging mine countermeasure infrastructure. The goal is to create a platform that can accommodate several different modular systems for mine hunting, mine sweeping, and mine neutralisation, officials stated.
- In September 2018, the U.S. Marine Corps Rapid Capability Office issued a request for information seeking autonomous and artificial intelligence technology to "increase Marines' ability to detect, analyse, and neutralize Explosive Ordnance in shallow water and the surf zone.
- In August 2018, at Southeastern New England Defense Industry Alliance's Defense Innovation Days, the Assistant Secretary of Navy Research, Development, & Acquisition, Mr. James "Hondo" Geurts spoke about the Navy's increased focus on agility, citing the use of Other Transaction Authorities and collaborative research agreements as examples of ways the government intends to speed its acquisition processes and progress technology development under its new strategy.

# RECENT DEVELOPMENTS





## NON-DILUTIVE FUNDING FROM U.S. NAVY

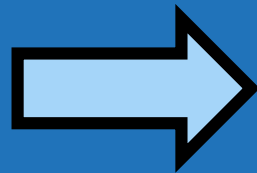
- The Company made its first sale to the U.S. Navy - the U.S. Naval Undersea Warfare Center (“NUWC”) for unexploded ordnance detection solution compatible with SwarmDiver™.
- Aquabotix delivered the first phase of a solution for unexploded ordnance detection missions by the U.S. Navy and allied forces.
- Funds for first phase of cooperation with NUWC were obligated in a short period of time. Additional cooperation phases are contemplated for future award, ultimately concluding with a potential full rate production of special use SwarmDiver™

CUSTOMER-FUNDED DEVELOPMENT TO  
ADDRESS SIZEABLE AND URGENT NEED

## NON-DILUTIVE FUNDING FROM U.S. NAVY

Ordnance disposed of or not exploding when deployed in previous conflicts poses a significant maritime threat. It is reported there are millions of kilograms of ordnance found in shallow waters across the globe. The risk of detonation, even decades later, is present and impacts trade or military missions.

current methods of detecting and locating unexploded ordnance are time consuming and expensive to conduct



- solution provided at “disposables” price point with ability to recover for continued use
- swarming functionality supports readings at multiple locations simultaneously, shortening process time
- result is a substantial and attractive offering for customers

AQUABOTIX IS PROVIDING A SOLUTION FOR A SIZEABLE AND OTHERWISE UNADDRESSED GOVERNMENTAL NEED

## 2<sup>ND</sup> U.S. MILITARY FUNDED CONTRACT

- Following the Company's first sale to NUWC, Aquabotix announced its second U.S. Navy funded contract in the recent months.
- Funds were obligated for additional development of the SwarmDiver™ system for military applications.
- This development effort will culminate in a demonstration of the technology for various U.S. Navy personnel.
- This development contract will provide greater flexibility in the systems' use while maintaining the benefits of conducting an unmanned mission.

PARTNERING WITH KEY CUSTOMERS  
FOR TRANSFORMATIVE TECHNOLOGY ADVANCEMENTS

## 3<sup>RD</sup> U.S. MILITARY FUNDED CONTRACT

- Aquabotix was awarded its first U.S. Navy funded contract for the purchase of SwarmDivers in April 2019.
- The hardware sale will support test and evaluation activities as the product is being considered for operational use.
- While the award amount of approximately US\$30,500 is small, with successful testing this contract could potentially lead to more substantial follow on orders.

KEY CUSTOMERS ARE CONSIDERING  
ADOPTION OF THIS CUTTING EDGE TECHNOLOGY

## 4<sup>TH</sup> U.S. MILITARY FUNDED CONTRACT

- In May 2019, Aquabotix was awarded its 4<sup>th</sup> U.S. Military funded contract related to the SwarmDiver™ system in the past year (the Company's 2<sup>nd</sup> U.S. Military contract for SwarmDiver™ product sales over a two month period).
- This approximately US\$150,000 award will enable necessary government evaluation activities for the Military's consideration of operational use of the product.
- This contract represents a meaningful and necessary step in progressing commercially developed product to a state of full operational use.

BUILDING MOMENTUM WITH A SOLID TREND OF  
DEFENCE ACQUISITION ACTIVITY

# STRATEGIC COOPERATION WITH THALES

- Aquabotix and Thales have signed a Memorandum of Understanding (MOU) for strategic cooperation.
- Thales is a global leader in defence, with a particular focus on underwater tech and mine countermeasures (65,000 employees and €15.8 billion in sales).
- Aquabotix's SwarmDiver™ and subsequent generations of Aquabotix's rapidly – deployable autonomous underwater vehicles are the focus of the MOU.
- Joint efforts will focus on minimising the adverse impact of mines on naval and commercial shipping activities globally, while removing personnel from harm's way.

VALIDATES AQUABOTIX'S LEADERSHIP POSITION  
IN UNDERWATER ROBOTICS

# TEAMING WITH MANTECH

- Aquabotix and ManTech signed a teaming agreement for strategic cooperation.
- ManTech brings domain expertise and solid reputation to this intended offering with more than 50 years of experience in advanced technological solutions and services for U.S. defence, intelligence community, and federal civilian agencies.
- The companies will jointly pursue U.S. government funds under a current requirement related to Department of Defense systems.
- This represents the 2<sup>nd</sup> announced collaboration agreement with a major prime contractor in the year following Aquabotix's strategy shift towards the defence market.

TEAMING PROVIDES ACCESS TO LARGER VALUE  
CONTRACTS USUALLY UNATTAINABLE BY SMALL FIRMS

## PROPOSALS ACCEPTED BY THE U.S. NAVY

- Aquabotix submitted 3 proposals for different capability demonstrations to be conducted during this year's U.S. Navy's Advanced Naval Technology Exercise (ANTX) event.
- ANTX is a recurring annual event that enables the U.S. Navy to identify science, technologies, and future concepts for the maritime domain.
- All 3 proposals were accepted with demos scheduled for summer 2019.
- These demos will showcase the capabilities of Aquabotix's SwarmDiver™ as well as a new vehicle system currently in development, fitting the theme "Prepare for Battle: Undersea Security".



*Aquabotix briefing U.S. Navy on SwarmDiver features and applications at ANTX 2018.*



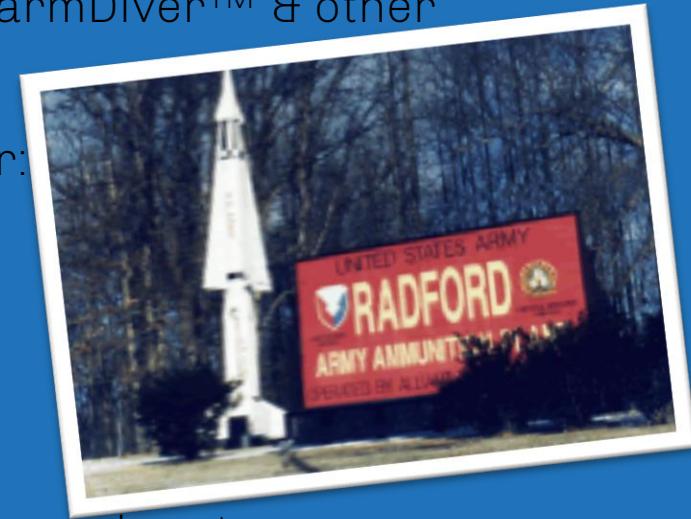
# AQUABOTIX LAUNCHED 3 NEW PRODUCTS

- Aquabotix launched 3 new products in the SwarmDiver™ family of products;
  - SwarmDiver STEALTH™ line for covert defence applications;
  - SwarmDiver NIGHTLINE™ line to support special operations missions; and
  - SwarmDiver EDGE™ line for security, deterrence, and harbor management purposes.
- These 3 new products are tailored for specific defence and commercial applications and expand the use cases for the SwarmDiver™ family of products.

EXPANDING OFFERINGS ENABLES BROADER USE  
& SOLVES CUSTOMER CHALLENGES

## CO-LOCATION WITH U.S. ARMY

- Established place of business at U.S. Army's Radford Army Ammunition Plant, an action that supports continued development of SwarmDiver™ & other unmanned vehicles for broader range of uses.
- Allows access to funding & support from U.S. Army for:
  - Facility Modifications
  - Equipment Upgrades
  - Improvement Projects
  - Marketing & Strategic Planning
- Enables expansion of product offerings, such as unmanned systems combined with explosives, as it provides means of securing facilities to level required for contracts with strict regulatory restrictions.
- Supports goal of enhancing connectivity with key customers.



# GRANTED FEDERAL EXPLOSIVES LICENSE

- Granted Federal Explosives License (FEL) from U.S. Bureau of Alcohol Tobacco, Firearms, and Explosives, enabling Aquabotix to develop, manufacture, store, and sell unmanned vehicles with explosive capabilities.
- Supports continued development of a weaponised SwarmDiver™
- An explosive-capability SwarmDiver™ has a multitude of offensive and defensive applications for militaries, including but not limited to:
  - Mine/Unexploded Ordnance Neutralisation
  - Unmanned Vehicle Threat Mitigation
  - Destruction of Key Enemy Networks or Infrastructure

AIM TO CREATE 1<sup>ST</sup> IN KIND, LOW-COST  
WEAPON WITH SWARMING FUNCTIONALITY

# COOPERATIVE AGREEMENT WITH U.S. NAVY

- Entered into a special purpose Cooperative Research and Development Agreement (“CRADA”) with NUWC, which provides access to their test facilities, ranges and personnel.
- CRADA enables testing and demonstration of SwarmDiver™ and other relevant technologies for the U.S. Navy and other interested parties.
- Shallow water ranges allow government, academic, and industry partners to expose prototyped and developed systems to real environments with minimum risk of loss.



## OTHER SUCCESSES IN U.S. MARKET IN 2018

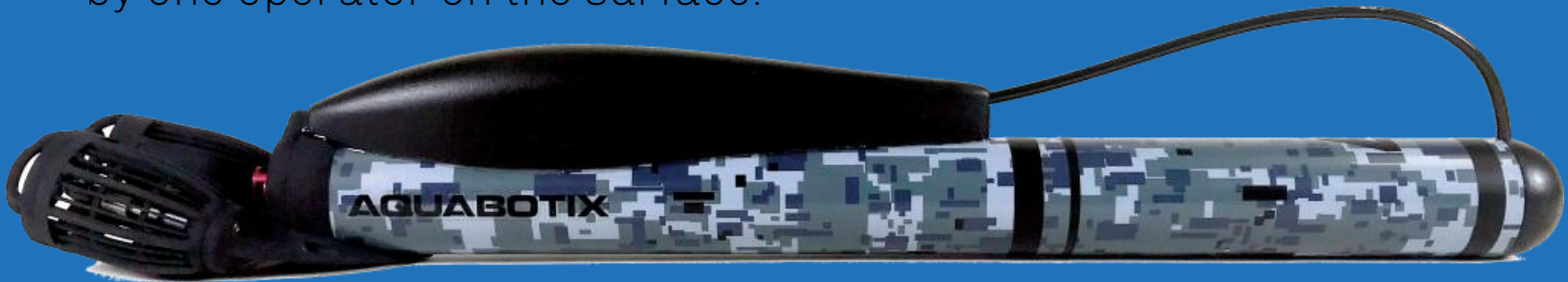
- Gained access to the U.S. Space and Naval Warfare Systems Command Other Transaction Authority agreement through membership in the Information Warfare Research Project (IWRP) consortium.
- Became a member of the Innovative Undersea Prototype Development Consortium (iUPDC) supporting the United States Navy's Forward Deployed Energy and Communications Outpost (FDECO).
- Joined the Undersea Technology Innovation Consortium (UTIC) and gained access to the Other Transaction Authority agreement with NUWC.
- Successfully demonstrated two products at ANTX 2018.
- Joined the Southeastern New England Defense Industry Alliance (SENEDIA) and showcased SwarmDiver™ at SENEDIA's Defense Innovation Days.

# PRODUCTS AND USE CASES



## MEET SWARMDIVER™

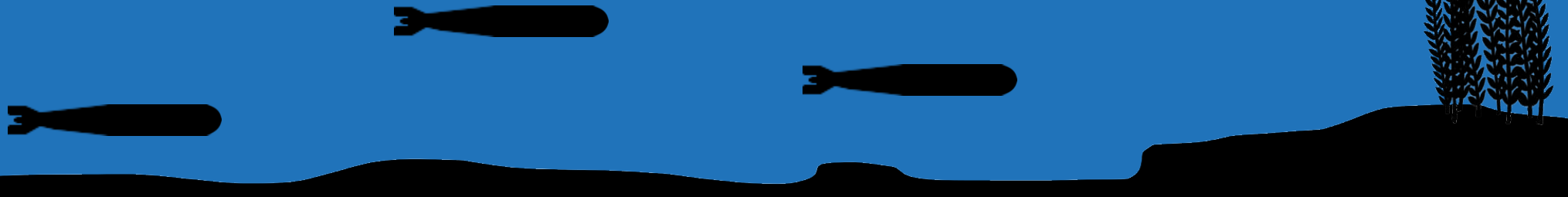
SwarmDiver™ is the first in its kind: a micro-sized, hybrid autonomous surface and underwater vehicle with swarming capabilities. SwarmDivers™ are surf-zone operable and deployable from any platform of opportunity. Multiple SwarmDivers™ can be controlled as a single coordinated entity by one operator on the surface.



## SWARMDIVER STEALTH™

The STEALTH line is intended for use in covert defence operations.

Featuring a ruggedized exterior coating over a specialty graphic camouflage paint, a low-noise emitting motor, and no visible status lights to deliver a stealthy mission capability for SwarmDiver™ to transit through littoral, harbor, and other challenging zones where avoidance of adversary detection is critical.





## SWARMDIVER NIGHTLINE™



SwarmDiver NIGHTLINE™ is stealthy and features an ultraviolet (UV) coating to make nighttime recovery of the vehicles easier. The UV coating is nearly invisible to the naked eye, but can be detected at night or in low light environments when illuminated by the right wavelength light source.



Aquabotix created this variant specifically with special forces use in mind.



## SWARMDIVER EDGE™

EDGE has applications in governmental, defence, and commercial domains. This line of vehicles is equipped with high intensity lights to create a visual boundary and act as a first line deterrent along a shore line, around a vessel or docking area, or near any other item of interest.

Aquabotix created the EDGE line of vehicles to respond to threats of piracy, militant, or other disruptions to commercial and governmental activities.



# LEADING THE WAY

Aquabotix is breaking ground in micro-marine vehicle market.

- Autonomous solutions with a simplified control experience;
- Ultra-portable and easily deployable vehicles;
- Reconfigurable design supporting a wide range of mission types;
- Swarm capability providing an inherent redundancy in the system and enabling a single operator to interact with multiple vehicles as a coordinated entity from a safe standoff distance;
- Solutions address the notoriously challenging shallow water and surf zones.



## BROAD RANGE OF USE CASES

Aquabotix's SwarmDiver™ is highly versatile and can be used in numerous mission types. A few of those applications are listed below.

- Intelligence and reconnaissance
- Harbor management and port security
- Disruption through explosive delivery
- Mine and unexploded ordnance detection and classification
- Stealthy data transfer
- Hydrographic surveys
- Asymmetric response to various asymmetric threats



# CAPITALIZING ON UNIQUE POSITIONING

Because of SwarmDiver's™ uniqueness, it is the Company's primary focus, rather than the legacy products. With successful demonstrations and flexibility in supporting various concepts of operations, there has been substantial interest in the product.

- Priced at approx. US\$10k – 20k each, depending on specifications
- Significant potential for high-value wins, with market size believed to be in millions of units\*
- Potential orders being pursued in tens of thousands to hundreds of thousands units each\*



\* Necessarily, not all (and there can be no assurance that any) of these sales opportunities will result in sales. Figures are based on quantities required to fulfil certain perceived operational requirements based on exchanges with potential customers only and do not tie to any firm requests for proposals or information.

## EXAMPLE USE CASE: MINE COUNTERMEASURES

By some estimates, the world's navies possess about 1 million sea mines. That's not counting water-borne improvised explosive devices that terrorists and navies can use to challenge military and commercial transit of maritime chokepoints, or even the high sea.

Aquabotix's SwarmDiver™, through the use of its spatially distributed swarm patterns, is capable of searching for mines at multiple locations simultaneously. Additionally, SwarmDiver™ can relay data wirelessly in near real-time, enabling allied forces to more efficiently find and neutralise these threats.

The U.S. Navy has begun funding developments for SwarmDiver™ related to this application.

*Petty Officer in Explosive Ordnance Disposal Mobile Unit One Inspecting an Inert Mine*

photo credit: US Navy



## EXAMPLE USE CASE: HYDROGRAPHIC SURVEYS

Currently, hydrographic surveys are done in advance of a marine landing force preparing to invade a beachhead. During these surveys, reconnaissance teams dive to collect information such as sea depth and bottom conditions.

Hydrographic surveys are conducted near shore and in shallow water, making this a dangerous and time-consuming activity. SwarmDiver™ can complete this mission quickly while keeping the operators at a safe standoff distance. It has successfully been demonstrated and well received by several militaries across the globe for this application.

*Marines attached to the 31<sup>st</sup> Marine Expeditionary Unit*

photo credit: MarineCorpsTimes (Petty Officer 1<sup>st</sup> Class Alexandria Seeley/Navy)

# OTHER DATA





## RECENT PRESS

*Naval Today, [Aquabotix Lands Another US Navy Contract for SwarmDiver Development](#)*

*Israel's Homeland Security, [New Solution for Old Challenge](#)*

*Jane's, [SwarmDiver to Begin Testing at US Navy's Undersea Warfare Centre](#)*

*Marine Technology News, [Aquabotix to Support US Navy](#)*

*Shepherd Media "Aquabotix unveils SwarmDiver micro USV/UUV"*

*Jane's, "Aquabotix adds the SwarmDiver USV to its family of systems",*

*Newsweek, ['Amphibious warfare' drones can operate in swarms to spy from the sea](#)*

*Institution of Mechanical Engineers, [Underwater robot swarms could 'overwhelm' military targets](#)*

*Marine Technology News, [Aquabotix Unveils New Swarm USV/UUV](#)*

*cnBeta, [Aquabotix Launches Autonomous Clustering Robot SwarmDiver](#)*

*The Register, [Descent of the Machines: Aussie firm boasts of underwater drone swarms](#)*

*Subsea World News, [Aquabotix Rolls Out 'SwarmDiver' Micro USV/UUV](#)*

*Drone Below, [Underwater Drone Swarms Now a Thing!](#)*

*Business Insider Australia, [WATCH: A robot swarm working together to encircle a boat](#)*

*New Atlas, [Aquabotix unleashes swarming, swimming, autonomous robots](#)*

# IMPORTANT CAUTIONARY NOTE

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