Topic: N102-182

Hydronalix, Inc.

Compact, lightweight Autonomous Underwater Vehicle (AUV) with robust navigation and range for riverine reconnaissance
Hydronalix has become a recognized international leader in robotics innovation. Developers and manufacturers of manually controlled rescue robots to fully autonomous mobile buoy platforms with advance sensor systems. New technology centers on a hybrid unmanned surface vehicle used to carry radar, sonar, weather stations, cameras and advanced communication devices. The new hybrid technology extends mission range. Focus on lightweight materials results in improved payload capacity, increasing speed, and improved durability. Initial platforms will focus on uses such as improving port security operations. Risk has been reduced by previous Navy development work resulting in operational electric or gas prototype sensor boats. We are looking for Defense customers that have need for small, low cost, lightweight, and highly efficient unmanned surface vehicles with capability to carry sophisticated instrumentation.

Technology Category Alignment:

Mobility
Modularity
Unmanned Ground and Sea Vehicles
Sensors

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SYSCOM: NAVAIR
Contract: N68335-17-C-0075
Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=N68335-17-C-0075

Department of the Navy SBIR/STTR Transition Program

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NAVAIR 2017-674

Topic # N102-182

Compact, lightweight Autonomous Underwater Vehicle (AUV) with robust navigation and range for riverine reconnaissance

Hydronalix, Inc.

WHO

SYSCOM: NAVAIR

Sponsoring Program: Program Executive Officer, Air Anti-Submarine Warfare (ASW) Special Missions Programs (PMA-264)

Transition Target: PMS 408 Mark 18 Program

TPOC:
(301)342-2094

Other transition opportunities: Navy Search and Rescue

Notes: The image depicts Hydronalix's new unmanned surface vehicle (USV) with advanced sensing capabilities.



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WHAT

Operational Need and Improvement: There is a need to enhance the basic mobile gateway buoy (MGB) platform being developed to support PMS 408's Mark 18 unmanned underwater vehicle (UUV). The main key aspects to address are: increase power development for longer mission duration; hull re-design to accommodate increased sensor payload, transit/escape speed; reduce surface expression; magnetic signature reduction and subsurface detection; and incorporate sensors into hull.

Specifications Required: The new improvements will be based upon lessons learned and adaptive missions that have been identified during previous development efforts. The mission requires approximately 30 hour duration, over horizon communication, operations in sea state three or higher, man portable, and payload consisting of an acoustic modem, radar, and color/thermal cameras.

Technology Developed: Hydronalix has been successful in the development of an enhanced USV that improves the propulsion, hull form, and navigation system to the basic AMB platform. Major enhancements include a new hybrid propulsion system using heavy fuel generator that recharges on-board lithium polymer (Li-Po) batteries powering twin electric motors attached to two small jet pumps. The new hull design provides payload compartment space for carrying customer's sensor packages among previously qualified instruments such as radar, sonar, weather station, and cameras utilized for mission fulfillment.

Warfighter Value: The new USV platform will provide the warfighter with a tool they can use to improve mission fulfillment and success rate by providing support to PMS 408's Mark 18 UUV program in their Mine Countermeasure (MCM) missions. In addition, the warfighter will have the ability to perform additional high priority tasks at minimum risk due to enhanced Intelligence, Surveillance, and Reconnaissance (ISR) capabilities to increase adaptability to other critical Navy missions by incorporating advanced sensors in an effort to increase adaptation to marine environment.

WHEN

Contract Number: N68335-17-C-0075 **Ending on:** March 31, 2019

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Design New Slightly Larger Platform	High	Successful development of new hull design with demonstration in open ocean.	7	May 2017
Increase Power Development	High	Perform an endurance test of the power development system in open ocean environment.	7	October 2017
Evaluate Design Concepts for Improved Stealth	Low	To be determined by fleet program.	8	May 2017
Magnetic Signature Reduction	Low	To be determined by navy program office.	9	September 2017
Integrated Sensor Packages in USV	Med	Successful demonstration in ocean environment.	8	October 2017

HOW

Projected Business Model: The ideal business model is to be an original equipment manufacturer (OEM) supplier of autonomous USVs platforms to large prime contractors. Company has already established successful manufacturing processes for the commercial line EMILY with domestic and international sales.

Company Objectives: Successful transition from high end prototype development to manufacturing of manually controlled rescue robots to fully autonomous mobile buoy platforms with advance sensor systems.

Potential Commercial Applications: Other potential applications include: Search and Rescue, Port Security, anti-poaching law enforcement, and earth science mission.

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