



Research and Development on Unmanned Surface Vehicles

July 19, 2021

Fiscal Year 2021 Report to Congress



**Homeland
Security**

United States Coast Guard

Foreword

July 19, 2021

I am pleased to present the following report, “Research and Development on Unmanned Surface Vehicles,” which has been prepared by the U.S. Coast Guard.

House Report 116-458 accompanying the Fiscal Year 2021 Department of Homeland Security Appropriations Act (P.L. 116-260) directs the Coast Guard to provide a report on the plans for research and development activities related to unmanned surface vehicles.

Pursuant to congressional requirements, this report is being provided to the following Members of Congress:

The Honorable Lucille Roybal-Allard
Chairwoman, House Appropriations Subcommittee on Homeland Security

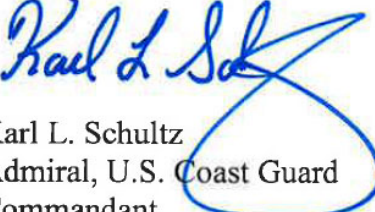
The Honorable Chuck Fleischmann
Ranking Member, House Appropriations Subcommittee on Homeland Security

The Honorable Chris Murphy
Chair, Senate Appropriations Subcommittee on Homeland Security

The Honorable Shelley Moore Capito
Ranking Member, Senate Appropriations Subcommittee on Homeland Security

I am happy to answer any further questions you may have, or your staff may contact my Senate Liaison Office at (202) 224-2913 or House Liaison Office at (202) 225-4775.

Sincerely,



Karl L. Schultz
Admiral, U.S. Coast Guard
Commandant





Research and Development on Unmanned Surface Vehicles

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I. Legislative Language

This document responds to the direction set forth in House Report 116-458 accompanying the Fiscal Year 2021 Department of Homeland Security (DHS) Appropriations Act (P.L. 116-260).

House Report 116-458 states:

Unmanned Surface Vehicles (USV).—The Committee directs the Coast Guard to report on the plans for research and development activities related to USVs not later than 90 days after the date of enactment of this Act, and of the subsequent findings when they are available. Such findings should include how data collected by these vehicles could augment current assets and support operational maritime awareness, surveillance and reconnaissance.

II. Report

The Coast Guard is researching new technologies, including autonomous systems, to improve maritime domain awareness (MDA). Increasing MDA can contribute positively to numerous Coast Guard mission sets, including counter-drug, migrant interdiction, critical infrastructure surveillance, port and coastal surveillance, environmental monitoring, spill monitoring, fisheries enforcement, security zone enforcement, and enforcement of laws and treaties. It is essential for the Coast Guard to achieve comprehensive MDA in the maritime regions under U.S. jurisdiction, and to have the ability to communicate, integrate, and analyze information rapidly that will facilitate effective and appropriate actions.

USVs offer the potential to expand MDA by providing distributed low-cost intelligence, surveillance, and reconnaissance (ISR) platforms. USVs could enhance the performance of crewed assets by expanding ISR capabilities in the vicinity of the crewed asset. Likewise, USVs could fill gaps where it is too risky to send people or when crewed assets are unavailable.

Unmanned Surface Vehicles

USVs are a relatively new technology compared to unmanned aerial vehicles (UAV), which have been in use for nearly two decades. The Coast Guard is evaluating the ability of USVs to provide persistent ISR capabilities in order to improve MDA, and has two projects to evaluate their capabilities and potential for integration into mission execution.

The first is an MDA pilot to determine the efficacy of using low-cost, commercially available technology solutions in combination with existing platforms. This project began in 2018 and culminated in a month-long technology demonstration in the fall of 2020. A final report is expected the summer of 2021.

The second is the Maritime Unmanned Systems Technology project managed by DHS's Science and Technology Directorate in partnership with the Coast Guard. This multi-year project began in 2019 to evaluate the use of USVs to provide persistent and cost-effective ISR capability for law enforcement, security, and pollution response missions in support of broad MDA objectives.

These two projects are the first extensive evaluation of USV technologies by the Coast Guard. The Coast Guard plans to continue research and development efforts of USV technologies to understand their capabilities and effectiveness for Coast Guard missions and to identify the attributes of a successful system. For example, the Coast Guard must determine if a large number of small USVs with limited sensors, speed, and maneuverability are more desirable than a smaller number of medium-to-large USVs with better sensors, speed, and maneuverability. USV performance also must be compared with the effectiveness of UAVs, space-based systems, and other technologies. The Coast Guard's continued research into USV technologies will provide these answers, and will support development of requirements and the eventual acquisition and fielding of appropriate systems to enhance MDA and mission performance.

Appendix: List of Abbreviations

Abbreviation	Definition
DHS	Department of Homeland Security
ISR	Intelligence, Surveillance, and Reconnaissance
MDA	Maritime Domain Awareness
UAV	Unmanned Aerial Vehicle
USV	Unmanned Surface Vehicle