

DRISI

CALTRANS DIVISION OF RESEARCH,
INNOVATION AND SYSTEM INFORMATION

Research

Notes

Maintenance

NOVEMBER 2023

Project Title:
Evaluation of Unmanned Surface
Vessel-Based Topographic and
Bathymetric Survey System in Flood
Conditions

Task Number: 3926

Start Date: January 1, 2022

Completion Date: March 31, 2024

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Evaluation of Unmanned Surface Vessel-Based Topographic and Bathymetric Survey System in Flood Conditions

Investigate the use of unmanned survey system for use in hydraulic studies.

WHAT IS THE NEED?

The California Department of Transportation (DOT) (Caltrans) conducts topographical and bathymetric surveys vital for modeling channel water flow and early detection of bridge scour. Deep water surveys can be especially hazardous under wind and flood conditions such as fast flowing currents, submerged and unobservable debris, blockades, sensitive habitats and the potential of getting stuck on mud.

A small Unmanned Surface Vessel (USV) platform with integrated topographic and bathymetric mapping sensors will enable surveys to be conducted in challenging environments such as high-flow flood conditions and shallow water where using a manned boat is unsafe.

WHAT ARE WE DOING?

A research team specializes in technologies such as laser scanning, multi-beam echosounder (MBES), unmanned aerial vehicles (UAV), will develop a teleoperated unmanned surface vehicle (USV) with topographic and bathymetric sensing system

WHAT IS OUR GOAL?

The goal is to improve efficiency and safety by developing a fully integrated bathymetric mapping system on a USV that can be deployed rapidly and safely in shallow and deep water conditions.



DRISI provides solutions and
knowledge that improves
California's transportation system

WHAT IS THE BENEFIT?

The USV mapping system will enable Caltrans to perform early detection and identification of bridge scour. It will improve the safety of the traveling public, reduce the hazards and exposure of sending manned boats and/or divers into swiftly flowing water.

WHAT IS THE PROGRESS TO DATE?

As of November 2023, the current progress is:

The research team has received an EchoBoat 160 from Seafloor Systems and have upgraded the thrusters to increase maneuverability that will be needed when operating the USV in flood conditions. Testing on the EchoBoat 160 will begin in August 2023.

A project panel meeting was held in July of 2023 to discuss the current progress on the research and make recommendations on future task work. Initial testing of the prototype USV took place in September 2023.

For more information contact the task manager.

IMAGE



Image 1: EchoBoat 160 for Seafloor Systems