



# Uncrewed Systems Research Transition Office

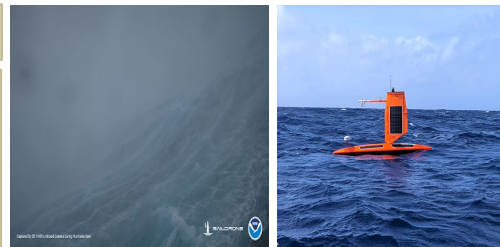
<https://uxsrto.research.noaa.gov/>

Supporting NOAA's mission through research and development of innovative technologies

**Uncrewed systems (UxS) have the potential to transform the way NOAA meets its diverse mission. From the top of the atmosphere to the bottom of the ocean, NOAA is developing UxS technologies to enable a persistent presence in even harsh or remote environments otherwise too dangerous or costly for scientists to work in. The UxS Research Transition Office (UxSRTO) is helping NOAA realize the potential these systems offer by supporting innovative research and development (R&D) of UxS technologies across NOAA's broad mission space. Additionally, UxSRTO facilitates the transition of UxS technologies into regular use and operations. This R&D is essential to preserving NOAA as the world's premier earth science and environmental observing organization.**

## UxS Can Revolutionize Severe Storm Forecasting and Coastal Hazards

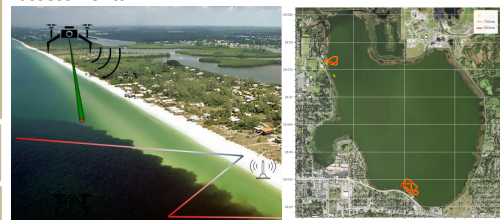
- NOAA's Atlantic Oceanographic and Meteorological Laboratory recently launched an uncrewed aerial system (UAS) into Hurricane Ian (Sept., 2022), collecting unprecedented data about the conditions of the storm as it neared landfall. NOAA scientists are now studying the impact that this type of data can have on hurricane forecasting.
- Uncrewed maritime systems (UMS) at the ocean's surface and below are being deployed to test how *in situ* measurements of ocean conditions can improve NOAA's ability to forecast hurricane tracking and the potential for rapid changes in storm intensity.
- NOAA's Northern Gulf Institute recently deployed long-range UAS over a historic flood event in Mississippi, providing real-time imagery of flood inundation and water levels to the emergency responders.
- UAS are being developed to respond to tornadoes and other high-wind damage events to better characterize high-wind damage and to improve disaster response and recovery.
- Harmful algal blooms (HABs) can devastate coastal communities through impacts to tourism, recreation and fishing. NOAA's UxSRTO supports development and incorporation of HAB sensors onto UxS platforms for rapid near-shore assessments of bloom patches.



Saildrone collection atop 50-foot wave during Hurricane Fiona September 22, 2022.



Birmingham Talladega National Forest 25 March 2021 tornado damage and Aerial image of Mississippi State University's (MSU) TigerShark XP3 UAS for flood assessments.



Data concept, trackline and direct download of HAB concentrations. Lake Parker Harmful Algal Bloom UAS test.

## Using UxS for Wildlife Monitoring and Marine Mammal Protection

- UxSRTO supports the National Marine Fisheries in the development of UAS for marine mammal research. Enhancements of this innovative technology will make this work safer and more cost effective.
- UxS are being developed for assessing and forecasting fisheries stocks.



Develop & conduct uncrewed aerial surveys to collect co-registered imagery for ecosystem assessments.

## What's Next For UxS?

UxS are a versatile tool to meet NOAA's mission in myriad ways. However, without dedicated, sustained support for R&D, innovation will slow and NOAA's premier position in the fields of earth science and environmental observing will be jeopardized. UxSRTO is enabling new innovations for NOAA to meet its mission by supporting this R&D.

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