

Removing Marine Debris with the Help of Drones

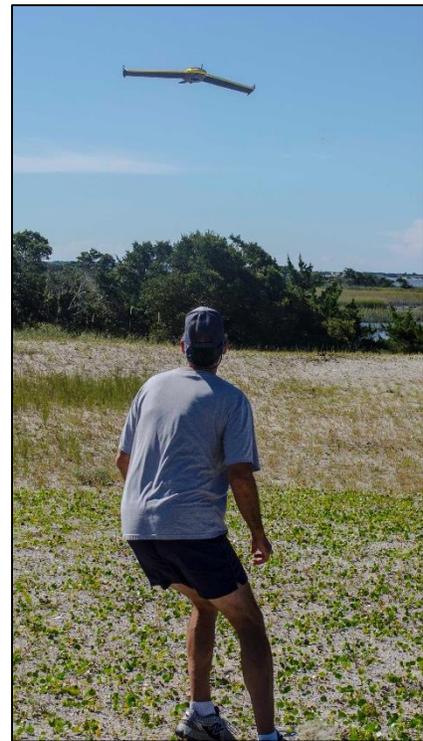
The Reserve recently received a competitive grant award from the NOAA Marine Debris Program to map and prioritize the removal of medium and large items of marine debris from the Rachel Carson Reserve in an effort to restore and protect coastal habitats. The project also aims to demonstrate how drones can be used to provide a technically sound and efficient way of assessing marine debris, prioritizing its removal and monitoring habitat recovery in North Carolina estuaries and beyond. Education and outreach efforts, including experiential learning opportunities, will target community members, students, teachers, scientists, and coastal managers.

Drones are a hot topic lately as their functionality and use has expanded both by recreational users (we're looking at you GoPro enthusiasts) as well as by researchers. New and innovative uses for drones crop up every day within the science and conservation community. They are being used to monitor protected areas, assess populations of endangered species, monitor shark movements, and [even to collect whale spit!](#) Through collaborative efforts between the Reserve and [Duke University's Marine Conservation Ecology Unmanned Systems Facility](#), an idea was born to use drones to map marine debris at the Rachel Carson Reserve.

One of the primary site management challenges at the Rachel Carson Reserve is marine debris (e.g. derelict fishing gear, tires, pieces of lumber, boats, etc.) that washes ashore from boaters, businesses, residences and improperly secured vessels and fishing gear, especially during higher tides and storm events. This debris contributes to the degradation of coastal habitats and has the potential to negatively affect a number of plant and animal species. Debris can also be a navigational hazard for boaters. This issue is not unique to the Reserve, but is a widespread local and regional topic of concern.

Why are the drones involved? Paula Gillikin, Central Sites Manager and project lead, believes that using drones to detect marine debris is a technically sound and efficient way of identifying debris throughout the Rachel Carson Reserve. "If you have visited the Reserve, you may already know that it is not one continuous land mass, but instead is comprised of many small islands with creeks throughout. This geography makes accessing the site in its entirety a challenge. Remote sections of the Reserve are visited less frequently by staff and volunteers, meaning that debris can be present for a long time before it is documented or removed. We have worked with Duke on a successful pilot study to detect debris with drones which led to this larger NOAA-funded project."

Over the next two years, this grant will support the removal of several tons of marine debris from the Reserve, restoring over 20 acres of habitat. The first step involves flying drones around the Reserve and producing a map that identifies where debris is located. The map will then be compared with an already established Reserve habitat map to strategically prioritize removal efforts, thus



A graduate student, working with Duke University's Marine Conservation Ecology Unmanned Systems Facility, flies a drone over the Rachel Carson Reserve to map marine debris.

maximizing the benefit to habitats. After the debris is removed, a combination of drones and on-the-ground sampling will commence to assess the damage caused by marine debris and to monitor the recovery of habitats after removal. This project will also serve a larger goal of testing if drones are an effective way to both map marine debris and analyze subsequent habitat recovery.

This work wouldn't be possible without a strong group of project partners. They are the Duke Marine Lab Unoccupied Systems Facility, the Town of Beaufort, the North Carolina Maritime Museum-Beaufort, North Carolina Sea Grant, and Wingate University.



Volunteers help remove marine debris from the Rachel Carson Reserve through a project funded by the [NOAA Marine Debris Program](#). Using maps developed from drone imagery, the project prioritizes removing marine debris from sensitive and important habitats on the Reserve.