

## Autonomous Platforms & Infrastructure

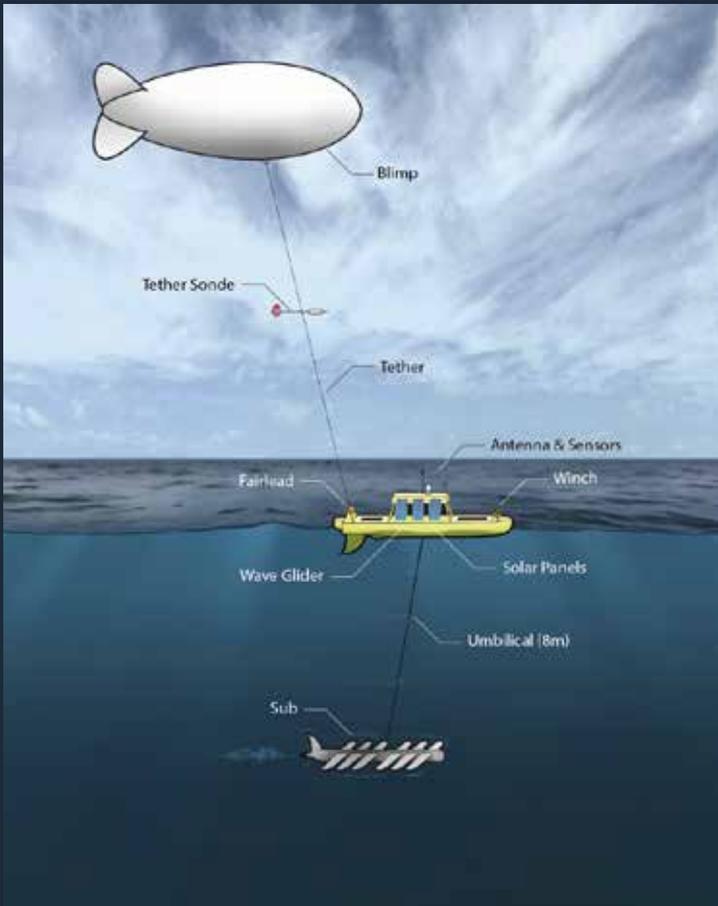


# The Need for Resilient Platforms

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The ability of autonomous platforms to navigate and interact in previously unexperienced environments can lead to unintended behaviors that jeopardize mission success.

Charles River Analytics' robust autonomy algorithms and software combine low-level sensing and perception of dynamic environments with mission-level understanding and decision making so robots can operate in dynamic and uncertain environments.



When you add our autonomy platform and infrastructure components to your existing systems, you will experience greater resiliency in your robotics solutions and extend their useful life.

Charles River Analytics offers robotic components and tools that reflect a deep understanding of applied AI autonomy, resulting in human-machine teams that can work together to complete missions and complex tasks.

*Are you looking to add autonomy platform and infrastructure capabilities to your existing AI systems? See how we've advanced these capabilities for our customers.*



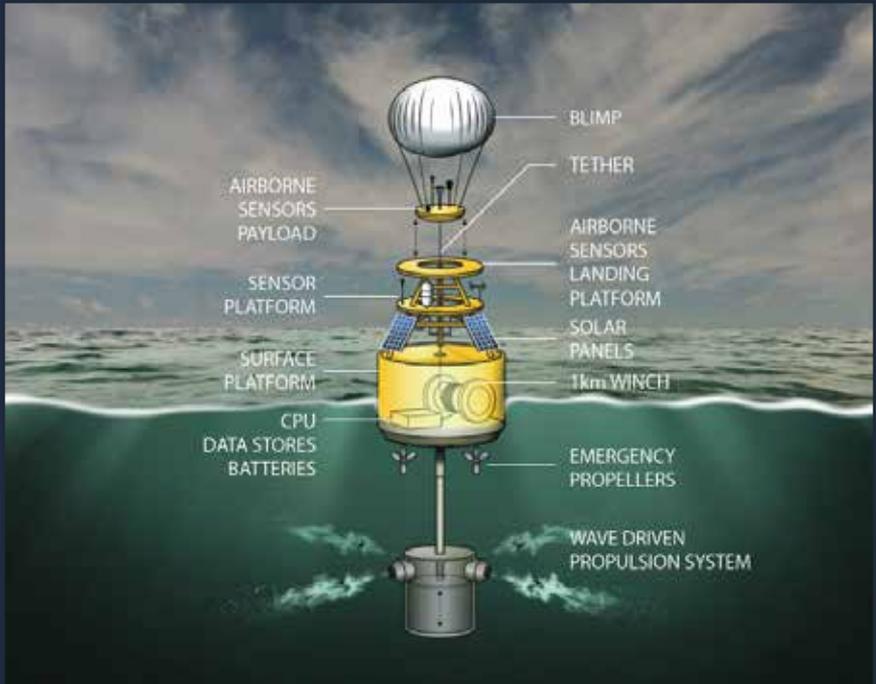
## Collecting Data at the Air-Sea Boundary

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The US Government wants to more accurately predict at-sea weather and climate at varying sea states. Because current measurement methods are costly and gather data only in normal sea states, scientists need a low-cost method to remotely sample the air-sea boundary for long durations under different at-sea conditions.

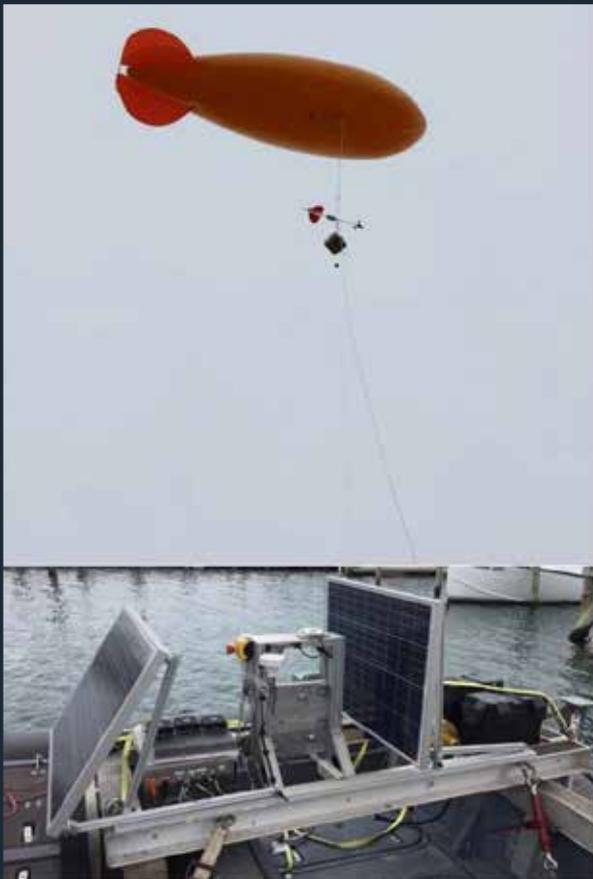
Charles River Analytics and our partners at the Massachusetts Institute of Technology can help improve predictive models of weather and climate with Smart Weather InstruMentS (SWIMS), our autonomous, mobile marine meteorological platform that independently measures environmental parameters such as pressure, temperature, humidity, and wind speed in an air column (from sea level to a 1km altitude).

SWIMS is a mobile system that can navigate autonomously to multiple sampling locations and operate independently for months at sea. The autonomy onboard our SWIMS platform can conduct adaptive measurements to capture the dynamics of the air-sea boundary layer. Our platform sends real-time data from remote sea locations to an on-land weather station, providing valuable information for weather forecasting and predictions. Scientists can also command SWIMS to change its location and behavior to improve the data available for analysis.



SWIMS platform

We originally developed SWIMS under an Office of Naval Research effort to measure the air-sea boundary layer. The mixing of air, moisture, and heat in this part of the atmosphere drives many weather and climate phenomena, so accurate measurements of this layer can improve the accuracy of weather and climate forecasts. Air-sea boundary data collected by the SWIMS platform will improve predictions of weather such as hurricanes, monsoons, and typhoons and help the Navy to tune/calibrate instruments to operate in these environments.



*SWIMS test-bed platform*

## About Charles River Analytics

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Charles River Analytics has been at the forefront of human-centered AI R&D, implementation, and deployment for decades. We transform our customer's data into mission-relevant tools and solutions to support autonomy and human decision-making. Charles River continues to grow its technology, customer base, and strategic alliances through programs for the NIH, DoD, DHS, NASA, and the Intelligence Community. We address a broad spectrum of mission areas and functional domains, including sensor and image processing, situation assessment and decision aiding, human systems integration, cyber security, human-robot interaction, and robot localization and autonomy. We take on the most challenging problems in the most difficult environments, and deliver insights that lead to action.

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