Subject:	UK Met Office trials AutoNaut to replace weather buoys
Reference	AN0038

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Robust ultrasonic anemometers from Gill Instruments are withstanding the elements on data buoy applications across the World's oceans.

Gill WindSonic ultrasonic anemometers are renowned for reliability in harsh environments and are used worldwide as part of comprehensive weather buoy networks, to provide high-quality wind data on the oceans climates.



AutoNaut Wave Glider

An AutoNaut has successfully completed a four day trial off Plymouth carrying Met Office sensors. With the help of Plymouth Marine Laboratories (PML), a suite of weather sensors provided by the Met Office put to sea aboard our 3.5m pre-production boat Iona with the aim of testing the viability of collecting forecasting data in a new and more cost effective way.

Jon Turton, head of Marine Observations at the Met Office, said: "From our perspective we are looking to assess whether an unmanned surface vehicle can be used to make reliable metocean measurements of the same quality as a moored weather buoy, and whether USVs could offer an alternative to operating moored buoys."

Iona carried the same sensors as the Met Office use on ocean buoys to provide data for weather forecasting, including wind speed and direction, barometric pressure, air humidity and temperature, and also sea temperature.

The trial took place over four days and nights on the Western Channel Observatory run by PML where there are scientific buoys with the same sensors fitted. This will make possible a direct comparison between calibrated data from the buoys, and data gathered aboard the AutoNaut.

Last year Iona was out for 11 days in the same area. She carried a weather station on the mast, but not the same make of sensors as used by the Met Office, and the trial was not calibrated. The data was encouraging, but not scientifically comparable.

This time the sensors on the buoys were freshly calibrated by the Met Office, working with PML, with the aim of providing a validated trial.

The trial aims to find out what are the differences in data provided by a moored buoy, and a small boat circling in the same area. One difference will be the height of the sensors. On buoys they may be 3m above the water. On the pre-production AutoNaut available for this trial they were 1.5m above the water. However AutoNaut is scalable, so it will not be difficult to build larger boats with 3m masts, if the results are positive.

A USV like AutoNaut could be preferable to a moored metocean buoy because buoys are expensive to moor and maintain with support ships, and in storms they sometimes break free. If AutoNaut can gather the same quality data, it will be possible to collect data for weather forecasting at reduced cost.

AutoNaut can be launched from a beach or slipway and make its own way to the buoy location. Once there it can circle on a 25m radius until told to return to base for recovery. This means that with a couple of AutoNauts to replace each other on station it will be possible to do all the maintenance ashore, even for buoys moored in the deep Atlantic. This would be another step forward in making practical use of modern autonomous capability.

“During this trial we had a good range of weather, from flat calm to 42 knot gusts,” said MOST (AV) Director Mike Poole. “These small boats have been through storm and gale in the open Atlantic, so we are quite confident they are seaworthy. Over the coming weeks we look forward to comparing the two sets of data from AutoNaut and the from the Met Office sensors on the L4 buoy.”

Dependable performance



Our WindSonic range of anemometers has been installed into some of the marine industry’s most strenuous applications due to its proven solid-state technology including the current Met Office buoys. Resilient to harsh environments, our wind speed and direction sensors are low cost, low maintenance devices, providing fit-and-forget installation and mast mounting, reducing offshore service costs.

WindSonic sensors are suitable for an almost unlimited range of marine based applications and deliver real-time, accurate measurement data and a truly dependable performance on buoy, port and vessel applications.