

# YachtGOOS

A Recreational, Global Ocean Observing System

John Allen<sup>1</sup>, Emilio Tesi<sup>2</sup>, Calum Fitzgerald<sup>1</sup>, Matteo Unetti<sup>2</sup>, Justin Dunning<sup>3</sup> and Paolo Cipollini<sup>4,2</sup>

- 1 MyOcean Resources Ltd, Hornchurch, UK ([www.myocean.co.uk](http://www.myocean.co.uk))
- 2 Environmental Ocean Team Ltd, London, UK
- 3 Chelsea Technologies Group Ltd, West Molesey, UK
- 4 National Oceanography Centre, Southampton, UK

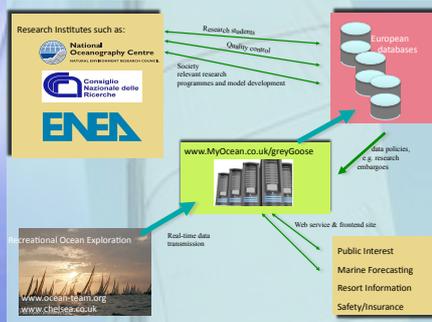
## ABSTRACT

YachtGOOS is a project to create a recreational global ocean observing system; it represents the aspirations of hundreds of yachts-men and women. YachtGOOS offers real-time automated monitoring of the marine environment over diverse regions of the coastal and open ocean, leading the way in both technology and environmental policy.

The YachtGOOS project is being spun up by a consortium led by MyOcean Resources Ltd, Environmental Ocean Team Ltd (EOT), Chelsea Technologies group (CTG) and research partners such as the National Oceanography Centre (UK) and ENEA (IT). The aim of YachtGOOS is the funding of a project for maybe one hundred yachts, with a long term view towards recreational vessels becoming part of standard monitoring networks. YachtGOOS is a crowd sourcing data collection project with a strong citizen science theme and we expect the structure of the project to have applications in other areas of science. The strong European focus results from our interest in obtaining EU commission funding, but there has been considerable interest from elsewhere in the world already. The involvement of national and international research institutes will help to assess the data quality in the pilot projects. Once funded, the YachtGOOS project will enable scientists at the NOC, ENEA and other research organisations to harvest added value from the datasets, this will include satellite calibration/validation in complex coastal waters and data assimilation into general circulation models. More immediate society critical applications could include the forecasting of toxic algal blooms.

Discrete, miniaturised sensor packs fixed to the outside of the vessels will collect data for between one and two years and be replaced during routine yacht maintenance periods. The sensor packs will communicate wirelessly to an iPad/iPhone or tablet in the vessels chart room/cockpit, this in turn will automatically use a form of mesh network communications transferring data to the central data server. Yachts will automatically be involved as communications 'nodes' in the mesh network, and power for the communications will be provided by flexible solar panels.

In this poster we will present initial data from two pilot projects using a current CTG instrument on board the mono-hull *Kaitek* voyage around the world and the catamaran *Lo Spirito di Stella* voyage across the Atlantic. Both pilot projects were organised by EOT and the yacht owners, and their objective is to establish what is achievable regarding data quality and transmission and where advances can be made. Recreational yachts offer a complementary observing 'skill' to the more traditional commercial 'vessels of opportunity' and 'ferry-box' routes. Yachts will provide a more random, but wider spatial coverage of the difficult to characterise shelf and coastal waters of the world, where calibration and validation of current and future earth observing satellites is critically important. Yacht owners are also the more adventurous mariners and we may rely on them to acquire ocean surface data in the most diverse and remote regions of the global oceans.



- There have been a multitude of 'one-off' experiments with novel instruments or platforms e.g. Volvo global races (ctd), more recently SolOcean One-Design (pCO<sub>2</sub>)
- Now there is a wealth of near-mature instrumentation
- And the will and desires of 10's, 100's or 1000's ? of recreational yachts - men and - women
- We aspire to the creation of a mechanism for the **routine collection of environmental data from recreational vessels**

- Discrete sensor pack
- Disposable/re-recyclable – sustainability
- Periodic replacement during maintenance cycles

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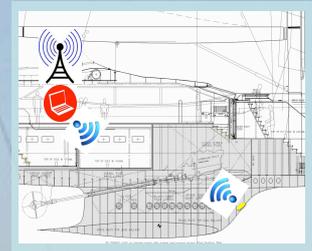
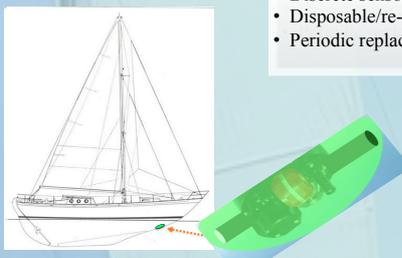
### Transatlantic adventure under way

Information supplied by NOC that our first for a 2000-tonne catamaran heading to Africa. The vessel is now in the middle of the Atlantic and is successfully crossing a gulf well.

A 2000-tonne catamaran, the *Lo Spirito di Stella*, is currently being used to collect data for the YachtGOOS project. The vessel is currently in the middle of the Atlantic and is successfully crossing a gulf well.

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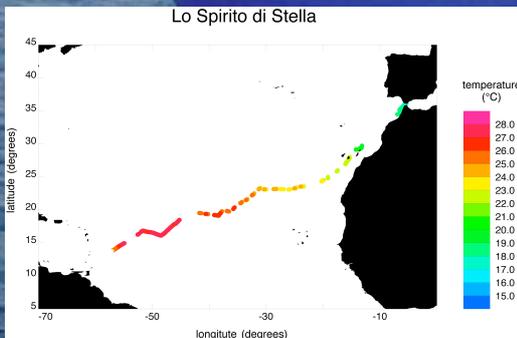
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- WiFi to laptop in chart room
- Mesh network comms between laptop nodes, 3G to main data server
- Power for comms provided by flexible solar panels

The YachtGOOS consortium was invited to carry out a demonstration project on board *Lo Spirito di Stella*.

A second similar project has just finished on the Pogo 40 racing yacht *Kaitek*.



Ideal data set for satellite calibration and validation, particularly in difficult shelf waters

... early warning ... harmful algal bloom prediction ... hydrocarbons ... benefit to shellfish industry for example

