

# 8<sup>th</sup> EGO Meeting and International Glider Workshop

Presented by  
**UG<sup>2</sup> / EGO**

May 21–23, 2019  
Rutgers University, New Jersey

## Oceanids - Developing a Command & Control System for the UK Long range Fleet

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### Abstract (Oral Presentation)

The NOC operates the National Marine Equipment Pool (NMEP), the largest of its kind in Europe, including over 30 gliders. The Command and Control (C2) is a new web-based IT infrastructure to maximise the use of NMEP robotic systems, reducing piloting load and extending time spent in the water collecting quality data. C2 development focuses on the following topics:

1. IT infrastructure for multiple vehicle types. Access to the vehicles is via web standard well-defined, machine interfaces (APIs). This approach allows identical access to data from all gliders, and consistent APIs for vehicle control. Pilots and scientists will be able to develop advanced survey strategies and control heterogeneous fleets. Open source technologies and industry standards are used throughout to ensure the C2 can be easily deployed on commercial cloud services or local servers with minimal modification, increasing resilience.
  2. Unification of piloting tools. In contrast to existing vehicle and vendor-specific piloting tools, the C2 is a series of web interfaces, with shared design patterns and visual language. While the tools for Slocum and Seaglider produce vehicle-specific output, the user interfaces are consistent and familiar, reducing human error.
  3. Data pipeline. The C2 encompasses the British Oceanographic Data Centre, enabling the automatic production of EGO Netcdf datasets from near-real time (NRT) glider data.
  4. Framework for autonomous piloting. Using the underlying APIs, the C2 will provide the necessary safeguards and constraints to allow the creation of multi-vehicle co-operative survey strategies by collaborators and stakeholders. Working with the Scottish Association of Marine Science, we are evaluating the design through the creation of a path-planning algorithm to pilot a glider through an area of high-current in the North Sea.
  5. Advanced data services. To increase utilisation of vehicle measurements, we are using Hydrobase to develop a statistical quality-control system for NRT data. This will be demonstrated on the Ellet Array by Summer 2019, using a Deepglider, Slocum and Seaglider.
  6. Risk and reliability. The C2 collects data from lab tests through to vehicle recovery, providing tools for analysing trends and assessing mission risk, increasing fleet reliability.
- We will present current work on the C2 alongside the motivating problem, focussing on the underlying infrastructure, the piloting UI and the framework for autonomous piloting.