AtlantOS

Project	AtlantOS – 633211
Deliverable number	D3.6
Deliverable title	Glider App for public dissemination and outreach
Description	D3.6 Glider App for public dissemination and outreach: Primarily developed for outreach purposes the application will also include some functionality for glider pilots. The App will interface in realtime with glider communication stations on land. Functionality will be based and tested on planned glider missions by SAMS partner and will then be rolled out to other partners.
Work Package number	WP3
Work Package title	Enhancement of autonomous observing networks
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Comments	

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Contents

1   Introduction

In task D3.6. we were tasked with developing a "dedicated application for outreach purposes and to make the glider piloting easier". Working in close co-ordination with the amazing glider pilot community at the Scottish Association for Marine Science (SAMS), we (Bruncin d.o.o.) have developed an app combining the requirements for public dissemination and outreach of glider data with the more complex set of requirements for glider pilots.

The interface is served as a web service, consisting of the Public / Outreach User Interface and the Internal / Pilot User Interface. Both of these user interfaces share the same internal infrastructure such as the core database for meta-data and glider data, as well as the same web server space for storage and serving of processed vehicle data (e.g. as plots or data files).

2   Public / Outreach User Interface

The initial Public/Outreach User Interface has been implemented on the SAMS glider server and has been subsequently modified and upgraded based on the feedback provided by the SAMS glider community and their outreach activities. The goal was to create an easy to use and intuitive user interface which would not require any complex instructions to use.
See more at http://vocal.sams.ac.uk/dashboard.php .

2.1   Overview (Dashboard) Page

This page is designed to show all active (ongoing) missions and vehicles (gliders) currently in use. This is a quick and easy way to display all ongoing glider activity in multiple missions or on multiple projects on one page (see section 5.1. for complete view). The end-user can customize the Map (show/hide, adjust height) and the Refresh Rate (on/off, set refresh interval) using the pop-down menu in the top-right corner above the map (in red square below).

2.2   Mission Page

This page is designed to show all active vehicles within the selected mission. All the other user interface features are the same as on the Dashboard page (see 2.1. above).

2.3   Individual Vehicle Page

This page is designed to show the current active mission for the selected vehicle (glider). In addition to all the other user interface features from 2.1 and 2.2 above, you can also see the most recent data plots, as selected by the site administrators (in the case of SAMS, head pilot Estelle Dumont). See section 5.2. for complete view.

3   Internal / Pilot User Interface

The initial Internal/Pilot User Interface has been implemented on the SAMS glider server and has been subsequently modified and upgraded based on the feedback provided by the SAMS glider community during their glider missions. As with the public UI, the goal was once again to create an easy to use and intuitive user interface which would not require any complex instructions to use, combining all the information and tools needed by the pilot to a set of key views, all within a click or two at the most.

To see more use the LOGIN button at http://vocal.sams.ac.uk/dashboard.php . Please contact lovro.valcic@bruncin.com for access to internal website.

3.1   Overview

The Internal / Pilot User Interface is divided into several sections used for completing or monitoring various components of piloting tasks.
1.   Missions: Setting up the past and current missions.
2.   Pilot Log: Main pilot community communication tool and mission log.
3.   Tools: Glider Manager to manage the glider icons and colours and Glider Plots to manage the plots displayed on the individual glider pages.

3.2   Missions View

In Missions view, glider pilot can manage all the past, current and future missions using the Mission Manager interface. The Mission manager interface is a fully searchable and indexed list of all the past, current, and future missions with the start/end dates and times, as well as a list of vehicles which were used and all of their associated tracks, makers and data plots. This is a great tool to facilitate not only the management of ongoing missions, but also to remember past missions and quickly visualize them and access their meta-data and data.

In the view below, you can see currently active mission OSNAP #9 for the project OSNAP which is using only one vehicle, Seaglider called Bellatrix. The mission menu (opened below) features the link to the Mission Manager, as well as shortcut links to all active missions (OSNAP #9) and all active vehicles (Bellatrix).

3.3   Individual Glider View

This is the main view used by the pilots when monitoring and piloting the glider. You can see the list of all the features under section 5.3.

3.4   Pilot Log

Early on, we have noticed that the pilots were using individual notebooks to log their piloting shifts. Some of this data would also be manually copied from the notebook into a text file on the glider server so the other pilots could have a quick update. We saw an opportunity to develop a Pilot Log tool to capture all those notes and events, making a user interface which is easy to use and which is full-text searchable and indexed. All entries are automatically tagged by the logged in user (pilot) and the vehicle (glider) to which the log is related to. The pilots can quickly view all the changes across the whole fleet as they are made, as well as look for past changes and events.

4   Design and Requirements

This solution was designed to run on minimalistic servers which are usually used as glider base-stations, although it can also be implemented on dedicated web servers as well. Furthermore the design has taken into account the possibility to operate and track any kind of vehicle in the ocean which sends location, date/time updates and data, using modular design for each view which can be customized to various device types. A good example of this could be operating and monitoring a deployment of ocean drifters, along with seagliders, Slocum gliders and Wave Gliders, to name a few.

Current implementation of the app at SAMS is running on a 64-bit Linux server (glider base-station) using SQL database, Apache web server, PHP and JavaScript to provide all the functionality. Data acquisition and decoding is done by the proprietary seaglider basestation software and seaglider data processing is done using custom Matlab scripts developed by Estelle Dumont.

This system can easily be implemented on any other glider basestation or compatible Linux or Windows server at a different institute by either migrating the whole app to the other institute or by syncing up the data from the other institute to be visualised by this setup at SAMS.
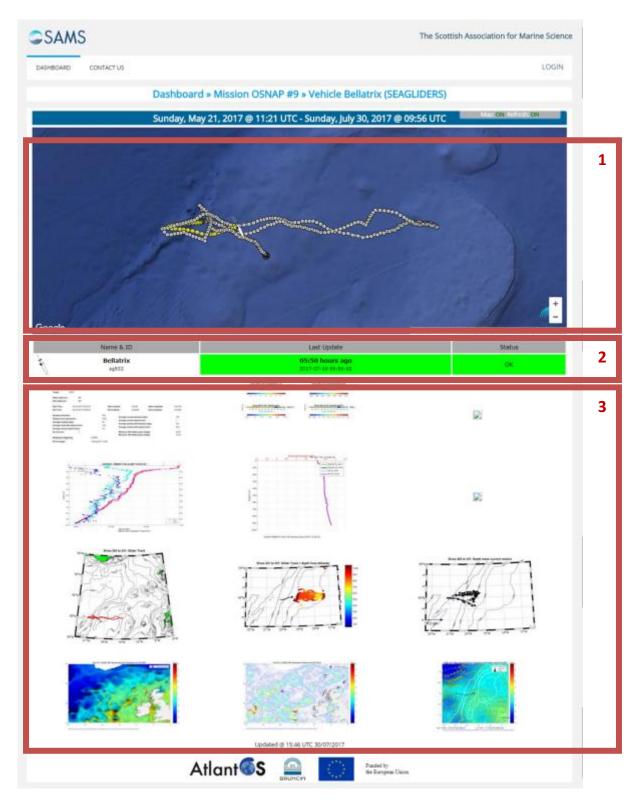
5 Appendices

5.1 APPENDIX 1. Public / Outreach User Interface - Dashboard

1. Contact Us: Link to SAMS Glider program page.
2. Login: Access to Internal / Pilot User Interface
3. Map and Refresh pop-out control
4. Main Map with glider(s) track(s) and start / end markers.
5. Table of active missions with additional metadata.

5.2 APPENDIX 2. Public / Outreach User Interface – Individual Vehicle View

1. Map with glider track and all the markers along the track
2. Table with most recent glider status update
3. Glider data plots selected for public / outreach view

5.3 APPENDIX 3. Internal/Pilot User Interface – Individual Glider View

1. Map Toolbox with Date/Time filter and a selection of dynamic map overlays.

2. Map with all glider tracks and markers, marker info windows with links to vehicle status and data, and icons for waypoints and warnings/error states from the vehicle.

3. Access to all previous processed data (dive numbers for seagliders).

4. Most recent dive metadata and links to relevant communication and log files.

5. All scientific plots (list managed from Glider Plots tool in the Tools menu).

6. All dive plots (list managed from Glider Plots tool in the Tools menu).

7. Links to prepared Matlab datasets for additional processing by individual pilot or data end-user.