CleanAtlantic

Tackling Marine Litter
in the Atlantic Area

WP 5 – Monitoring and data management
Activity 5.1 – Scientific and technical basis for data
collection. Development of bespoke tool.

WP	5 – MONITORING AND DATA MANAGEMENT
ACTION	5.1 – SCIENTIFIC AND TECHNICAL BASIS FOR DATA COLLECTION. DEVELOPMENT OF BESPOKE TOOL.
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Floating Litter Reporter: Facilitating floating litter monitoring for maritime stakeholders

1. INTRODUCTION

Litter, plastic in particular, is accumulating in our seas and coasts. Information and data on marine litter is essential for tackling it. Floating Litter Reporter was specifically designed concerning this issue, seeking to encourage citizen communities to make available relevant data while generating more consciousness at the local level on marine litter (**Figure 1**). By combining citizen engagement and modern technology to help tackle floating marine litter, Floating Litter Reporter offers a platform for marine litter communities to come together, share their knowledge and establish approaches to monitoring marine litter. Floating Litter Reporter was designed to support data collection events on boating/sailing trips at sea. During these trips, groups and individuals establish clean-up or monitoring events and take surveys with the mobile app to report on litter items found. The app uses a harmonized list of items agreed within the Clean Atlantic directives.
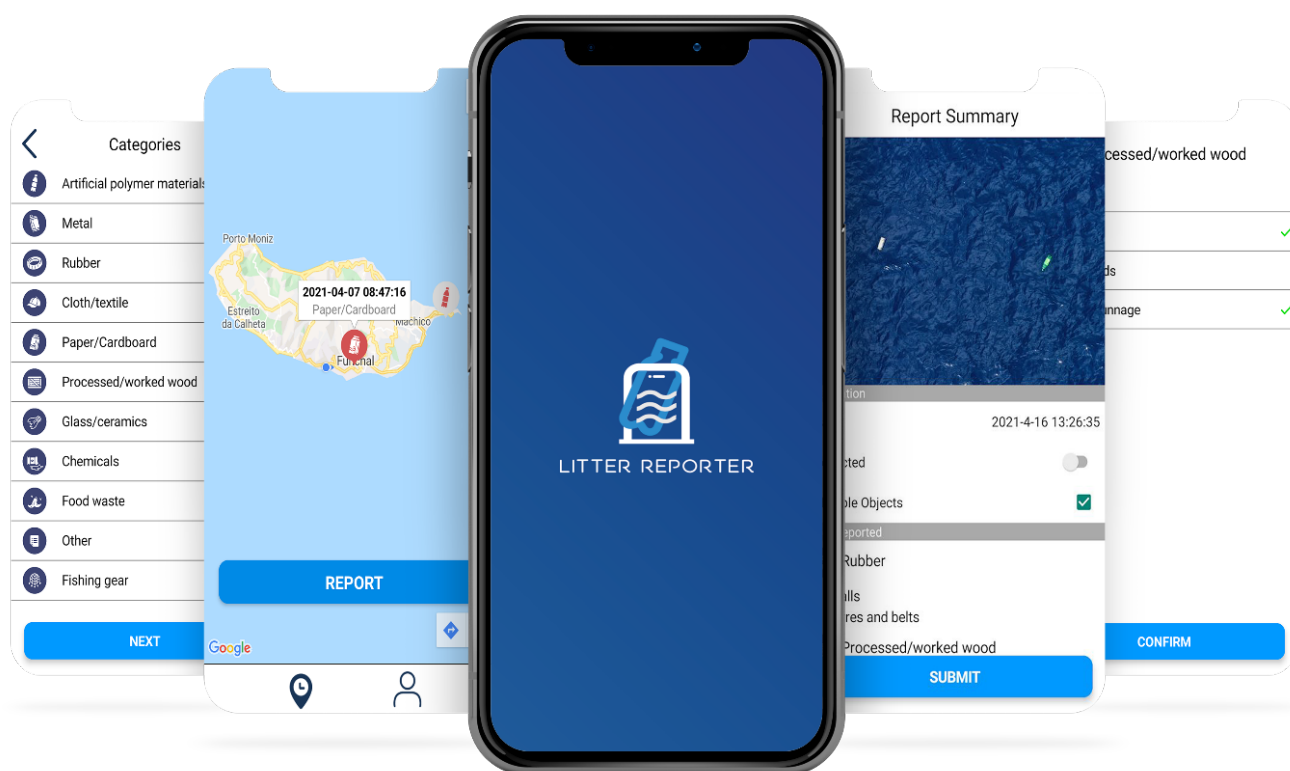

Figure 1: Overview of the Floating Litter Reporter App

2. FLOATING LITTER REPORTER APP

Floating Litter Reporter relies on the ability of users to report litter by taking pictures and submitting them using their phone's current georeferencing location. As such, several permissions are required that allow a user to successfully report a survey (location, camera, and folder permissions – **Error! Reference source not found.**).

When all permissions are given, the user must login, or create a new account. We have minimized the need for internet access though it is still required to sign in/sign up. During the actual survey, internet is not needed with reports being saved on the phone's local storage and being uploaded when back online. We therefore recommend being logged in before any journey.

When a user has gained access for the first time, the app will update and download all assets needed. Once the app is up to date, the home page is presented (**Figure**). On the home page the user can select settings on the lower right corner. Here he can choose the app's default language, edit user information, and send suggestions to improve the app. The entry page also reveals a map with all litter reports done up until that moment. It is possible to open any of those reports and examine what litter was reported, when and by whom (**Figure**). On this page, the photo taken by the user when reporting the floating litter is visible, and it is possible to tell if the litter reported was collected or not. If it was not collected by the previous user, it is possible for the current user to select the "collect" option and inform that the litter in question has been collected and stored by him.
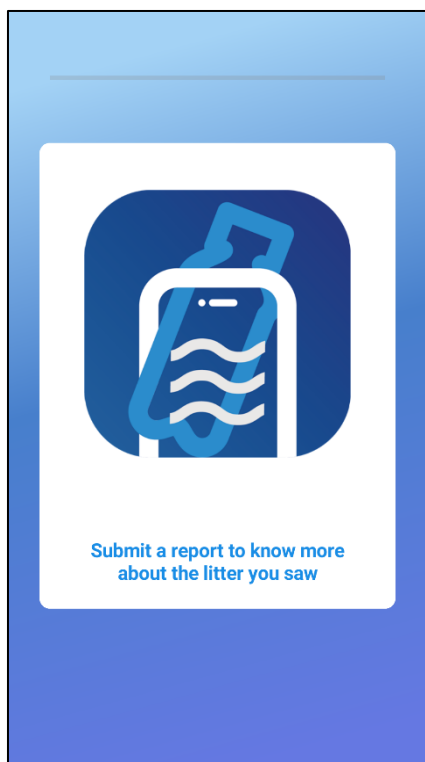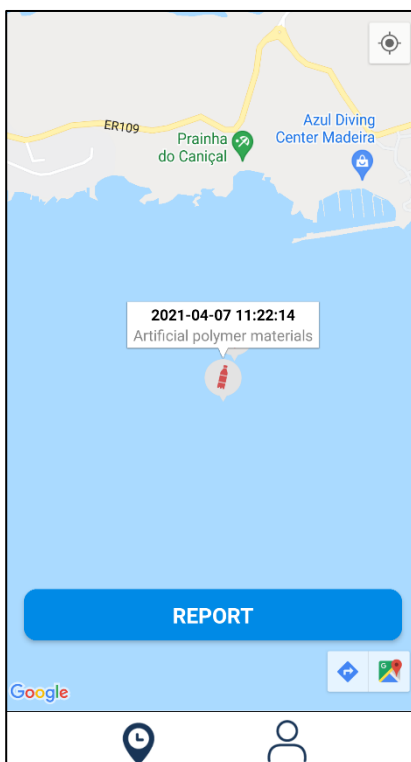

Figure 2: Permissions page.

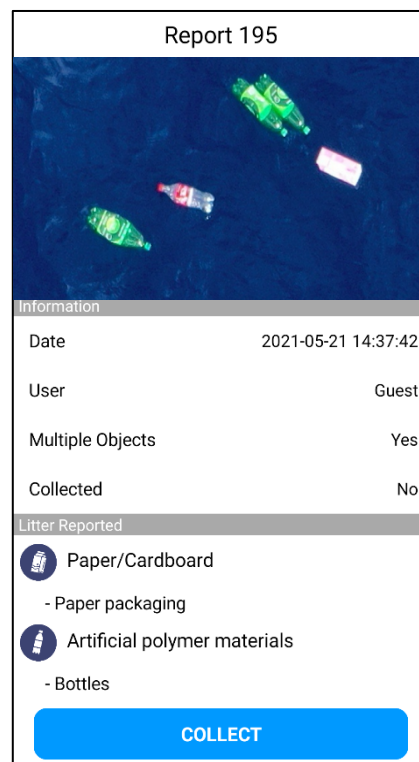**Figure 3:** Home page with map of all litter reports.



Figure 4: Reported Litter page.

When clicking on the report button the user is asked to take a photo of the collected litter and optionally categorize it. This will take the user to a page with litter classes grouped into categories of material type of litter object. The present categories are: Artificial polymer materials, metal, rubber, cloth/textile, paper/cardboard, processed/worked wood, glass/ceramics, chemicals, food waste, fishing gear and other (**Figure 2**).

It is also possible to select subcategories of each category and have specific objects within the major category (**Figure**). For instance, inside the category of processed/worked wood there are subcategories such as pallets, creates, wood boards, beams/dunnage. It is possible to select multiple categories and subcategories within a report. The user should select all existing types of litter inside a report and after selecting all the present categories and subcategories, it is prompted with a summary of the report (**Figure**). A page with the litter photos, the report date and a list with all litter reported in that survey is presented. The user can always edit the current report before submitting. Once the user is pleased with the report, he can finally submit the survey. If the user is utilizing mobile data, a prompt window will appear informing the size of the report and how much cellular data it will consume, the user is able to select an option that will save the report offline and submit it once connected to a wireless network (Wi-Fi). The database and the map will instantly be updated with the new report.
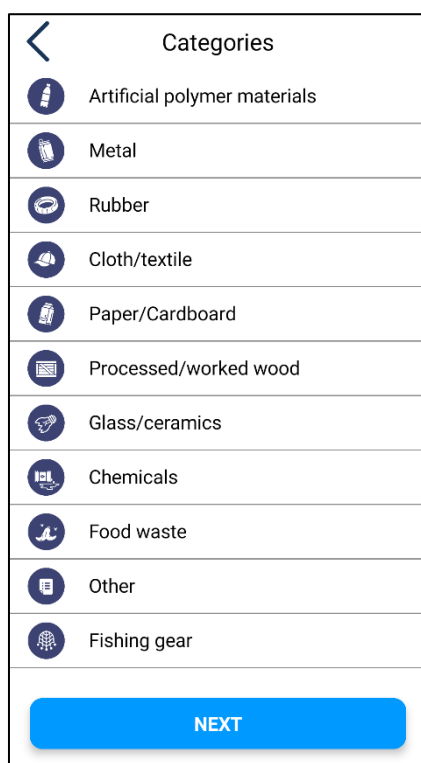
Figure 2: Floating Litter categories page.
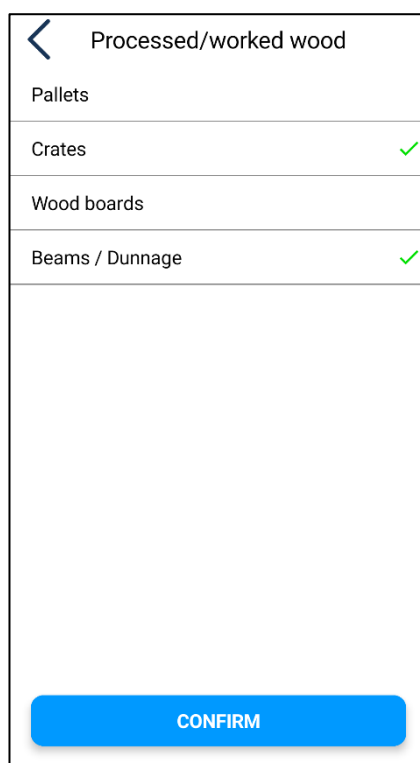
**Figure 6:** Processed/worked wood subcategories page.
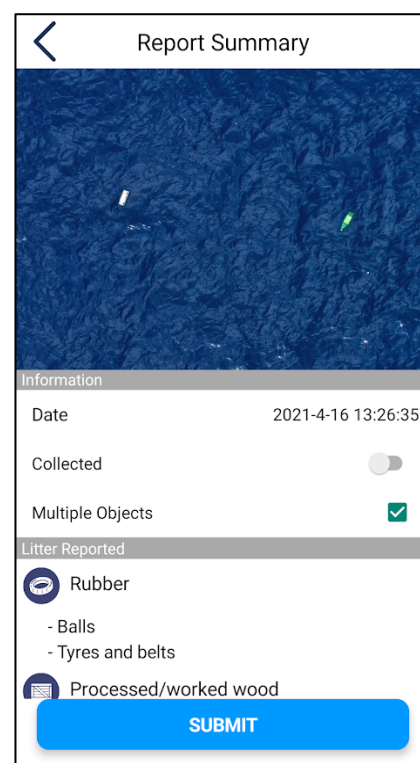
Figure 7: Report Summary

3. DATA STORAGE AND ACCESS

Data collected by the Floating Litter App users is stored in a database hosted by WAVE and made publicly available as soon as it enters the database without any further manual quality control. The users submitting the data are responsible for its accuracy. Data from the Floating Litter App can be visualized via a web dashboard interface at http://wave.arditi.pt/ (**Figure 8).** The database used in the map and graphs of the Floating Litter App data viewer is dynamically updated every time data is submitted providing real time information and, over time, maps of sightings of floating litter can be used to assess distribution and contamination levels.
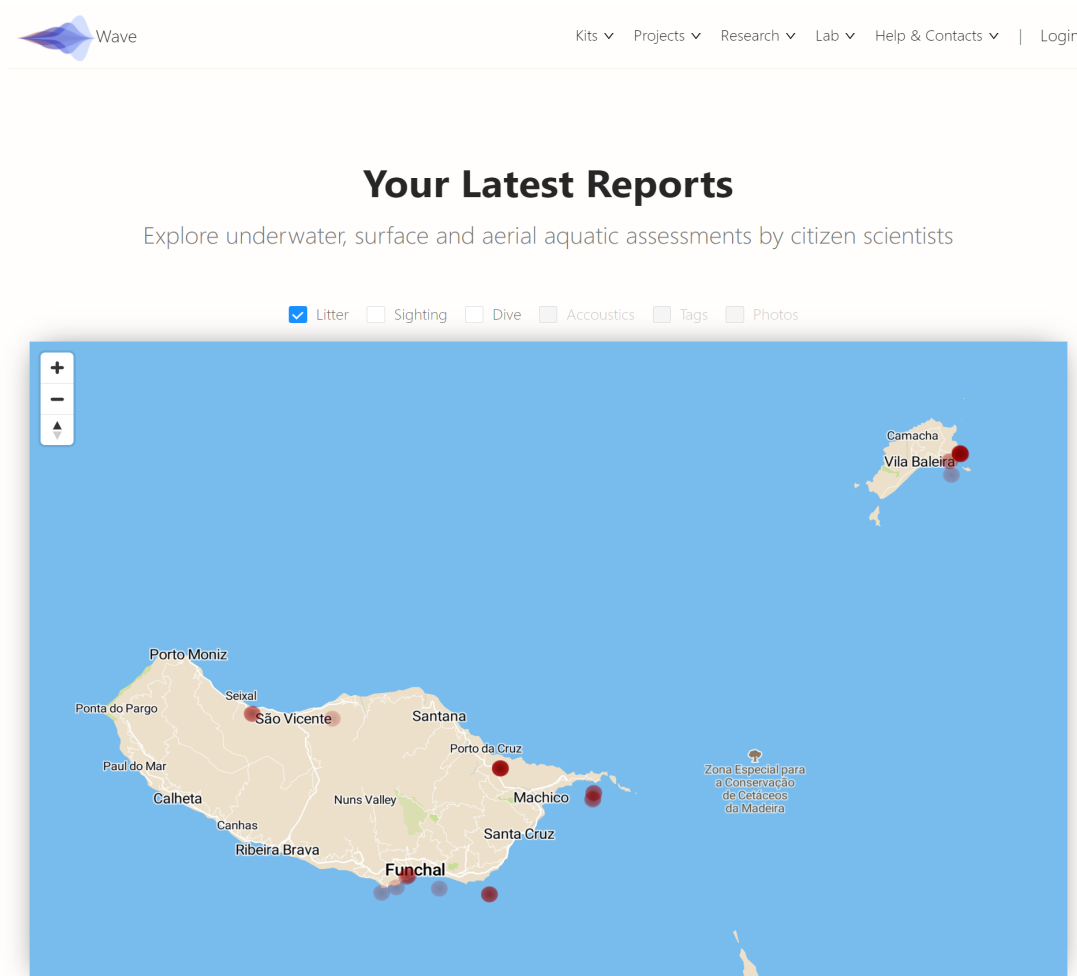
Figure 8: Web interface to visualize Floating Litter reports.

At present, the Floating Litter App data represents the effort made by select beta users collecting it and is therefore illustrative of the amount and type of items found on the surveyed areas. Raw data can be made available upon request and additional handling is required for using for other statistical purposes.

4. EXPANSION TO OTHER COUNTRIES

The Floating Litter App supports litter collection events at any geographic coordinates if there is GPS signal available. The app is currently supporting both Portuguese and English languages. We are working into expanding support for French and Spanish languages. The language settings are in the User settings (in the bottom right corner).
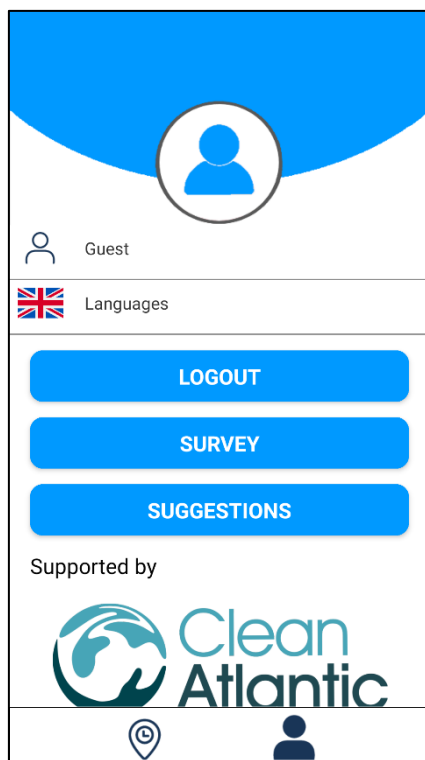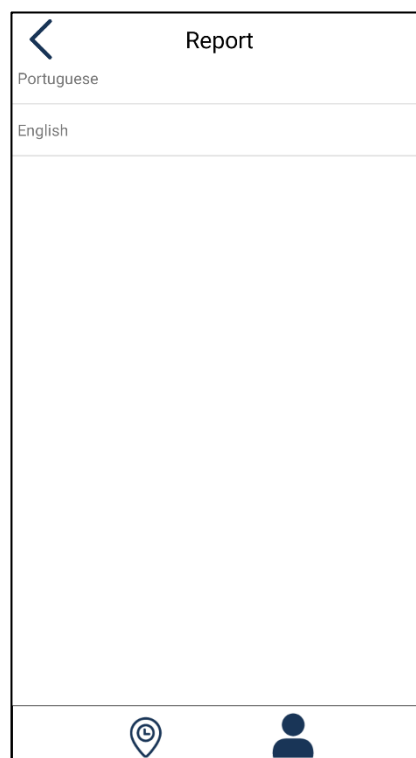

Figure 9 - User settings menu

Figure 10 - Language selection

5. FINAL CONSIDERATIONS

Due to the covid-19 pandemic, we were not able to organize with local boat trip companies any field tests/case studies. We hope soon, with the lifting of restrictions, to arrange expeditions to assess and gather information via these boat trips. This data will be included in a future peer-review paper.

The Android OS version of the mobile app is already available for download at Google Play store. The iOS version is operational and identical, however, due to Apple Store bureaucracy and requirements the App is not yet available in iOS AppStore.

The Floating Litter Reporter App will be used as a starting point to develop, litter within the scope of EAA Grant "Porto Santo Sem Lixo", another mobile app tailored to map and report beached litter. The concept is to provide citizens and stakeholder a suite of Reporter apps that can be used to collect and report data on litter but also on other relevant sightings (e.g. marine mammals, fish, seabirds).