

NET4mPLASTIC PROJECT

WP4 – Act. 3 Numerical simulation

D 4.3.4

Formulation and testing of a methodology for the collection and reporting of MacroPlastic items at sea by the volunteer observers

June, 2022 – Final Version

Project Acronym	NET4mPLASTIC
Project ID Number	10046722
Project Title	New Technologies for macro and Microplastic Detection and Analysis in the Adriatic Basin
Priority Axis	3
Specific objective	3.3
Work Package Number	4
Work Package Title	Demonstration activities: testing and improvement of developed methodologies
Activity Number	4.3
Activity Title	Numerical simulations
Partner in Charge	PP2 – Marche Region
Partners involved	LP - University of Ferrara (UNIFE); PP2 – Marche Region; PP3 – Hydra Solutions srl (HYDRA); PP4 – Prosoft D.O.O. (PROSOFT)
Status	Final
Distribution	Public

CONTRIBUTING PARTNERS	Regione Marche; UNIFE; HYDRA; PROSOFT.
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Data	Vers	Prep	Resp	Appr	Rev	Comment
21/05/2021	1.0	PP2 Marche Region	Gabriele Frigio	Alessio Lupi	Draft	Comment and approval
12/07/2021	2.0	PP2 Marche Region	Gabriele Frigio	Alessio Lupi	Draft	Comment and approval
19/12/2021	3.0	PP2 Marche Region	Gabriele Frigio	Alessio Lupi	Draft	Comment and approval
20/12/2021	4.0	PP3 HYDRA	Nicola Fraticelli.	Alessio Lupi	Draft	Comment and approval
09/02/2022	4.0	LP UNIFE	Carmela Vaccaro; Corinne Corbau; Elisabetta Olivo; Joana Buoninsegni.	Alessio Lupi	Draft	Comment and approval
09/02/2022	4.0	PP4 Prosoft	Nelida Pogačić	Alessio Lupi	Draft	Comment and approval
17/05/2022	5.0	LP UNIFE	Carmela Vaccaro; Corinne Corbau; Elisabetta Olivo; Joana Buoninsegni; Maria Nicoli.	Alessio Lupi	Draft	Comment and approval
30/06/2022	Final	PP2 Marche Region		Alessio Lupi	Final	

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1 The “Sea Sentinels” network

The main aim of this document is to provide an operative user manual on the essential procedures needed for the implementation of a network of voluntary “Sea Sentinels”. The procedures will be used by volunteers involved in the program, for the detection and reporting of presence of plastic waste scattered in sea waters.

The project partners identified and tested two different methods for the acquisition of georeferenced photos from the network of “Sea sentinels” (fishermen): through which the accumulation of macroplastics in the sea reported and monitored. The two methods are detailed below.

2 First method for the acquisition of georeferenced photos from the network of “Sea sentinels” – Author: Marche Region.

For the capture of geo-referenced images, the fishermen will use the mobile devices (Smartphones and tablets) they already own in which apps that can be freely downloaded from Google Play will be installed.

In details:

- the first app: GPS Map Camera implements the functions of a digital camera capable of taking georeferenced photos (LAT-LON coordinates, date and time) and storing them in a specific folder in the internal memory of the device;
- the second app: FolderSync or OneSync, runs automatically when the device is turned on and, when connected to the Internet. The app uploads the geo-referenced photos taken through GPS Map Camera in a Microsoft OneDrive folder connected to personal accounts of the “Sea sentinels” and accessible to the project team. Once stored in this folder, the Marche Region project team will examine the photos and will store them in a further folder whose access is open to the project partners.

2.1 Procedure for uploading the geo-referenced images

ATTENTION: The procedure described below refers to devices based on Android.

1. Register your account in the list of “Sea sentinels” through the following link:
<http://84.38.48.175/register-von4mp/form.html>

The following information must be provided: name, organization of affiliation and valid e-mail address.

Once registered, the credentials for accessing the one-drive folder associated with the registered account will be sent to the email provided, to be used in the configuration of the FolderSync or OneSync app.

2. Install the GPS Map Camera app:

<https://play.google.com/store/apps/details?id=com.jkfantasy.gpsmapcamera&hl=it&gl=US>



Configuring GPS Map Camera after installation:

- Open the app and grant all the permissions it requires (Take photos and videos; access the files on the device and the location while using the app);
- Note the destination folder of the photos by selecting the corresponding icon as follows: Generally it corresponds to / storage / emulated / 0 / Pictures / JK Fantasy / GpsMapCamera but it can be changed with another path chosen from the other four options. This destination folder must then be indicated in the setting of the synchronization apps described in the following point n.3.
- Choose the "Template" icon, select "Map + Lat / Long" as "Draw Style" and leave the check boxes unchanged, as in the figure, and then confirm by pressing the return symbol.
- Choose the "Settings" icon, and set the "GPS use" item to "good GPS Location" and the "GPS picture save" item to "One (map)", as shown in the figure, and finally confirm by pressing the return symbol
- Once the previous configuration steps have been completed, the photos can be acquired by clicking on the highlighted symbol:

3. Install the FolderSync app:

<https://play.google.com/store/apps/details?id=dk.tacit.android.foldersync.lite&hl=it&gl=US>

FolderSync is an app to be configured at the beginning so that when the device is turned on and, when connected to the Internet, it automatically loads the georeferenced photos taken with the first app in a Microsoft OneDrive folder connected to an account of the Teams platform in use in the Marche Region.



As an alternative to the previous one (in particular if the aforementioned app does not work properly), you can install the OneSync app:

<https://play.google.com/store/apps/details?id=com.ttxapps.onesyncv2&hl=it&gl=US>

Configure the Foldersync app after installation:

- Open the app and grant all the permissions it requires;

- b) Add the account for the cloud folder on Onedrive by selecting the "Add" item in the "Account" box, then choose Onedrive, press the "Login to your account" button and when requested enter the login credentials, email and password, received at following the registration procedure in step 1; After receiving the OK, press the "Save" button to confirm the setting.
- c) Configure the folders to be synchronized on the local device and on the remote cloud by selecting the "Add" and "Onedrive" items;
- d) Give the synchronization a name, eg "Onedrive starts"
- e) Select "To remote folder";
- f) In the "Remote folder" field, select the path "/" Images" using the corresponding highlighted icon;
- g) In the "Local folder" field, select the path set in the app configuration using the corresponding highlighted icon. GPS Map Camera; eg: for the first app "/" storage / emulated / 0 / Pictures / JK Fantasy / GpsMapCamera" while for the second "/" storage / emulated / 0 / DCIM / GPS Map Camera / Site 1" 1.
- h) Activate the "Schedule" option and choose the time interval in which the app will automatically synchronize in the presence of internet coverage (by default every hour);
- i) Select the "Advanced" options and set to always overwrite the oldest files, to use the local file in case of changes both locally and remotely, to try again in case of synchronization failure and press "Ok";
- j) Select the item "Connection" and choose to use any available connection and click on "Ok";
- k) Select the "Notifications" item and activate the "Completed activity" option and press "Ok";
- l) Press "Save" to confirm all settings; The app is now ready for automatic synchronization.
- m) Finally, go to the options for the Android system apps and check that the "Foldersync" app is enabled for automatic start when the device is turned on (This option varies depending on the model of device used).

Configure the OneSync alternative app after installation:

- a) Open the app and grant all the permissions it requires;
 - b) Add the account for the cloud folder by selecting the "Onedrive" item and when requested, enter the login credentials, email and password, received following the registration procedure in step 1. It may happen that the app closes, possibly reopening it;
 - c) Select the item "Synchronized folders", activate automatic synchronization and select "Add synchronized folders";
 - d) Set the remote folder and the folder in the device as shown in the following figures;
 - e) Choose the synchronization method "Load only" and press the "Save" button to confirm;
 - f) Go to "Settings" → "Automatic synchronization" and set: Synchronization interval: 1 hour; Instant loading: ON; Power Source: Charger + Battery; Internet connection: WIFI, Ethernet, Mobile.
 - g) If necessary, also enable "Automatic synchronization on slow 2G" and "Automatic synchronization in roaming" (N.B. some operators may charge additional costs).
4. **In the open sea, in the absence of an internet connection**, check that the Geolocation function of the smartphone is active and that the GPS map camera app is allowed to use it.

5. **Open the GPS map camera app** and ignore the no internet network warning (Tap OK), the app should still automatically record the GPS position in the photos. However, if the GPS function does not work correctly, you must then switch to manual mode, in which the coordinates must be entered manually (taking them from the on-board instrumentation) before taking the photos.

To switch to manual mode the steps are:

For the first app:

- a) Tap the position icon as shown in the figure;
- b) Select "Manual assign latitude / longitude";
- c) Use the interactive map or directly enter the coordinates in the two fields "Latitude" and "Longitude";
- d) Return to the camera screen with the "Back" button and TAKE THE PICTURE.

For the second app:

- a) Tap on "Map data";
- b) Activate the "Manual" mode;
- c) Enter the coordinates in the highlighted fields, adding the description of the place if necessary, and do tap on the yellow check mark at the top right;
- d) Return to the room screen with the return button, if necessary click on Ok if a message appears confirming the update of the location data and TAKE THE PICTURE.

6. Upon return on the ground and/or with an internet connection, to verify that the photos have been correctly sent to the Onedrive cloud folder, open the Foldersync app and tap on "history". If the "Onedrive starts" event corresponding to or subsequent to the date and time in which the last photos were taken does not appear from the history, return to the previous screen and tap "Synchronize all" in the Synchronization status box and observe that the loading of the photo starts and ends successfully.
If you use OneSync as an alternative, the status of the last synchronization appears on the home screen; with this you can possibly force synchronization by tapping the update icon.

3 Second methods for the acquisition of georeferenced photos from the network of “Sea sentinels” – Author University of Ferrara, Hydra Solution.

In order to disseminate the main results of the numerical simulations together with the methodologies developed and implemented for the collection of marine litter, it was proposed to involve some volunteers within the activity 4.3 of the project NET4mPLASTIC.

For this purpose, Marche Region developed a methodology suitable for the recording of localization and images of the waste gathered by fishing nets, and addressed to fishermen. During the testing phases some operational difficulties were recognised which were counterproductive, given that the mere installation of the applications for the sharing of the images was not user-friendly.

Therefore, also to expand the outreach of possible final users, UNIFE-GEO Team in collaboration with Hydra Solution proposed an alternative methodology for collecting georeferenced images of marine litter trapped and caught by fishing nets, but also observed by citizens and tourists that attend the coasts.

Accordingly, below is provided the description of the proposed alternative protocol.

3.1 Scope of the document

Scope of this document is to provide an operative user manual regarding the essential procedures to be performed for the correct implementation of the “Volunteer Observers” side project, needed by volunteers involved in the program of detection and reporting of presence of plastic waste scattered on sea waters.

The here below paragraphs shall depict minimum functional and non-functional requirements and practical procedures to adopt to carry out correctly the aforementioned activity.

3.2 Requirements

Volunteers shall be required to own a smartphone/tablet recent enough to be able to satisfy the here below minimum requirements:

- Operating system based on Android 7.0+;
- 2+ Megapixel camera;
- Smartphone/tablet with integrated GPS antenna;
- Permanent Internet connection and/or ability to connect to the Internet via WiFi for data sharing;
- Active Email address.

The volunteer shall be capable of:

- Install an application from the Android PlayStore;
- Run the application and capture images;

- Send images via Email.

3.3 Operating procedure

The procedures to be carried out by the volunteer, depicted in the here below paragraphs, are as follow:

Non-recurrent procedures (to be performed only once):

- Installation and configuration of the georeferenced image acquisition software;
- Acquisition of a valid Email address;

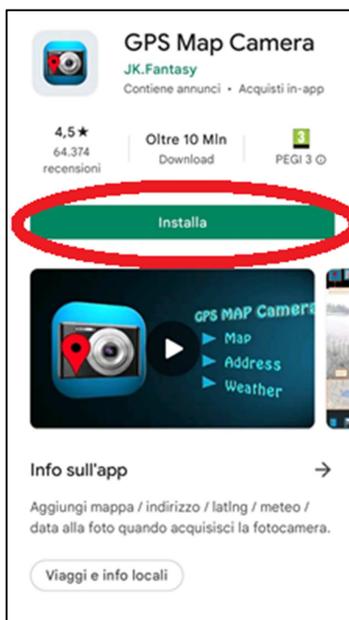
Recurring procedures (to be performed each time):

- Start of the software for the acquisition of georeferenced pictures and related activation (unless permanent) of geolocalization services (GPS ON);
- Acquisition of georeferenced frames;
- Sharing via Email client of georeferenced pictures at the address mp@net4mplastic.net

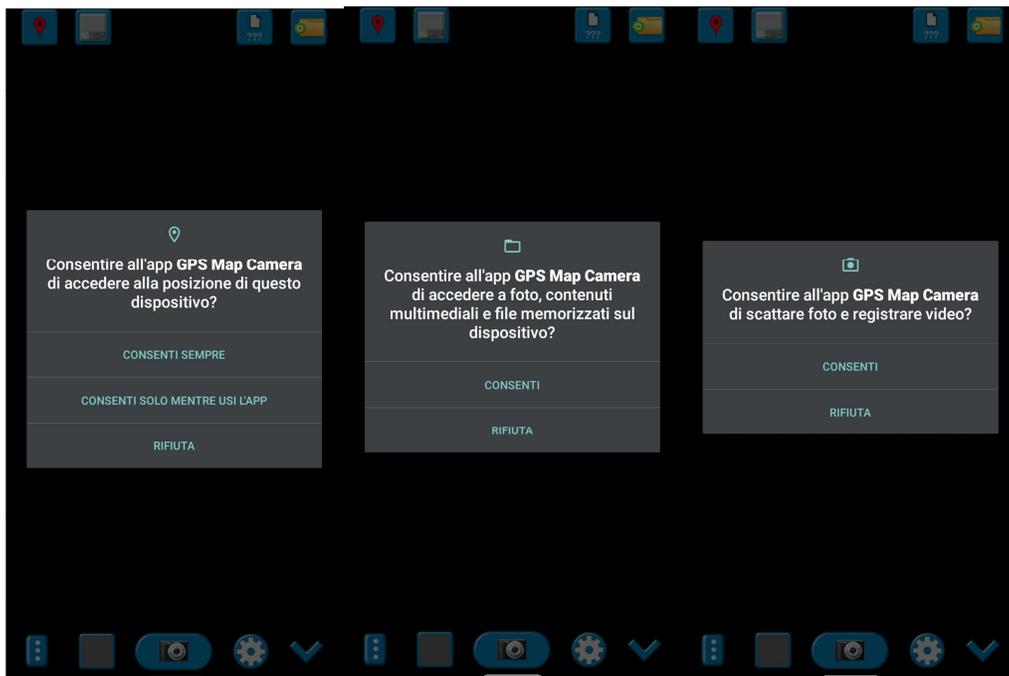
3.3.1 Non recurrent procedures

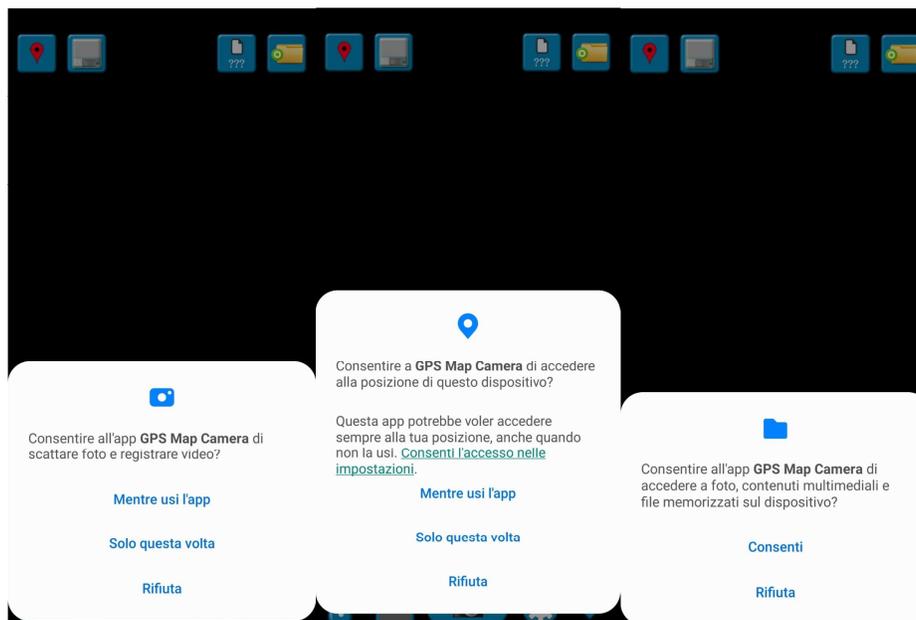
Below are depicted the non-recurring procedures necessary to the correct installation and configuration of the GPS Map Camera application, for the acquisition of georeferenced pictures. The pictures, for explanatory purposes, refer to one or more versions of the Android OS.

- Installation of GPS Map Camera software from Play Store, see here below picture, select "Install";

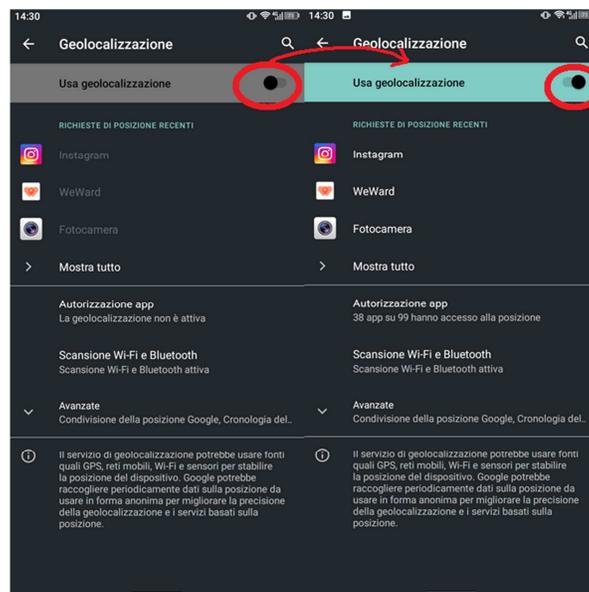


- b) Run GPS Map Camera software and setup as shown in the here below pictures, making sure to allow the required access authorizations (whereas possible, select “always allow” and/or “while using the app” and/or “allow”).

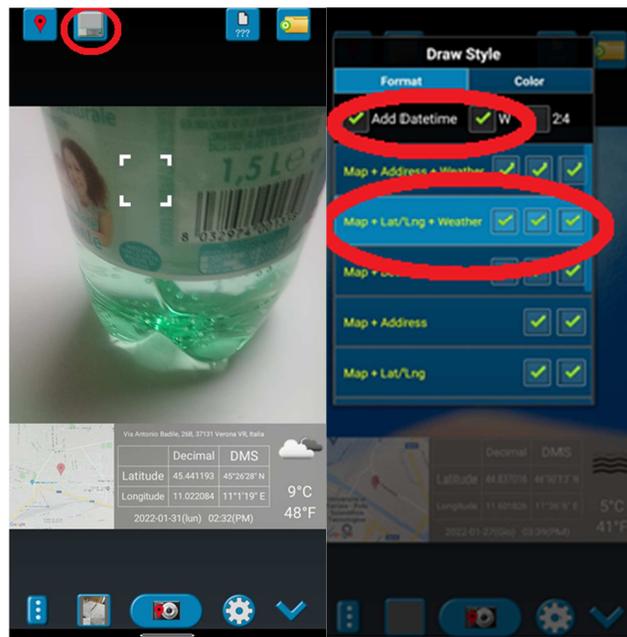




c) Enable image georeferencing, as shown in the here below picture;

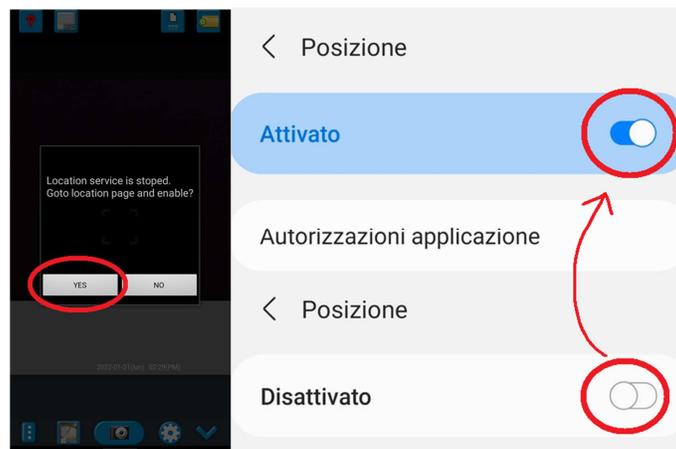


d) Tap on the icon as shown in the here below picture after making sure the aforementioned options have been ticked, with emphasis on highlighting in blue, by tapping on it, the here below depicted configuration row.

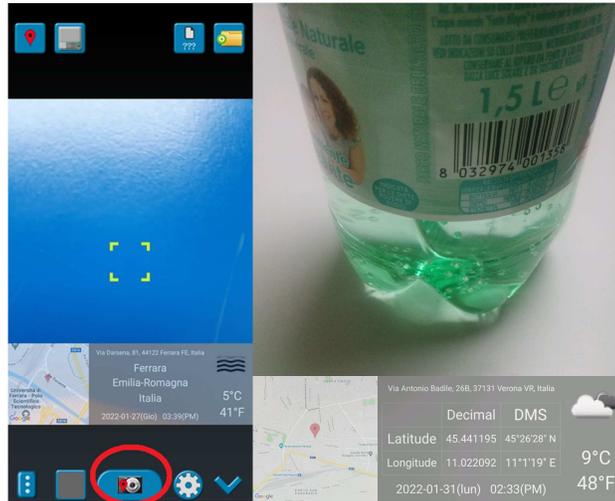


3.3.2 Recurring procedures

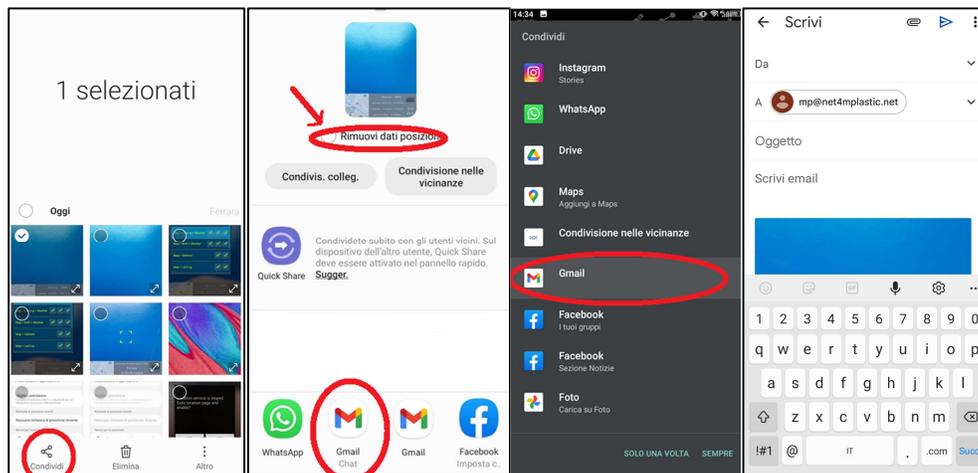
- Run the GPS Map Camera software;
- Should GPS services be disabled, and upon prompt by the software, consent to their activation, as shown in the here below pictures;



- Acquire images by tapping on the button shown in the here below picture;



- d) Share pictures from the gallery by means of the designated button shown in the here below picture. For multiple selections and upon request, **DO NOT** tick the checkbox related to the location data, then send the picture(s) via the usual email client at the address mp@net4mplastic.net



4 Annexes

Annexes to the present document are the user manuals of the first protocol (in Italian) and of the alternative one (proposed by UNIFE, Hydra Solution and Prosoft). The manuals are provided translated into the three main languages of the Interreg IT-HR programme: English, Italian and Croatian. The Croatian version was translated by Prosoft.

- D 4.3.4_Annex 1 - Methodology for volunteer observers
- D 4.3.4_Annex 2 - Alternative methodology for volunteer observers _ User Manual English Version
- D 4.3.4_Annex 3 - Alternative methodology for volunteer observers _ User Manual Italian Version
- D 4.3.4_Annex 4 - Alternative methodology for volunteer observers _ User Manual Croatian Version