

EZ Sargassum – Quick & Public-Friendly Citizen Science Protocol

Thank you for participating in the citizen science portion of the EZ Sargassum project. Your observations and input mean a lot to us.

The Marine Macroalgae Research Lab at Florida International University (MMRL-FIU) is part of a network in the Caribbean Region dedicated to monitoring the invasions of pelagic Sargassum on Caribbean beaches. While satellite imagery can estimate the abundance of Sargassum influx in the region, local observations are just as valuable in refining the actual scope of the Sargassum landing on Caribbean coasts.

The app needed for the EZ Sargassum is **Epicollect5**. Epicollect5 is a free, open-source citizen science app that is both compatible with Android and IOS. This app was originally developed in Imperial College, London and has since been used on a variety of citizen science projects. The app is used for on-site observations, but can also be used for off-site, previous observation submissions. The app interface follows a “survey” model that asks for questions to be filled out and photos to be uploaded.

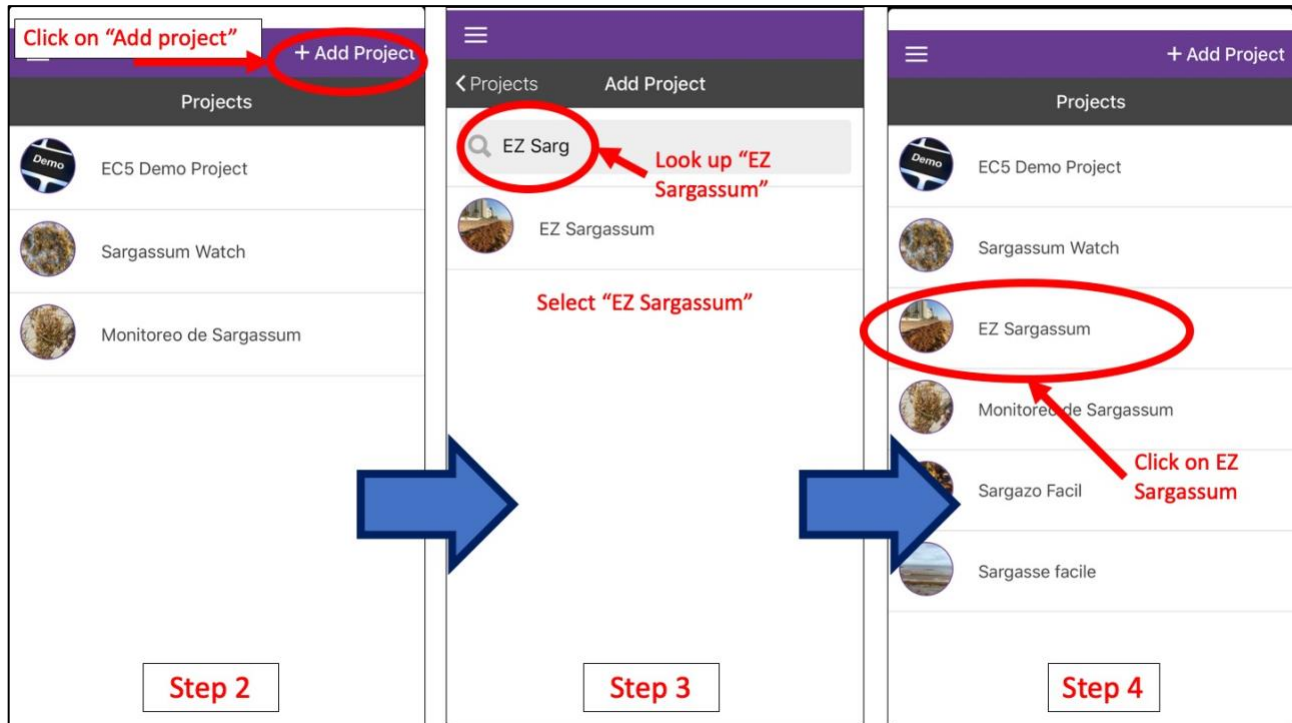


Follow the directions below to record Sargassum in the field:

Step 1: Download the Epicollect5 App onto your smartphone, if you haven't done so already. Open the App.

Step 2: On the top right hand corner, click on "+ Add project."

Step 3: Search for "EZ Sargassum". Once found, click on the project name. The *EZ Sargassum* project should be on your main page*.



Step 4: Click on the EZ Sargassum Project, and near the top-right corner, click on "+ Add entry".

Step 5: You may receive a message requesting location access while using this app. This is necessary for GPS coordinates. Click on "Allow".

Step 6: Follow the directions as outlined in the Sargassum data sheet. *In situ* observations allow you to automatically record date, time, and GPS coordinates of location.

Step 6.1: The first two pages (pages 1 and 2) will ask for today's date and GPS coordinates. All sections are required. The date and GPS will automatically calculate for your on-site observation.

The image displays three sequential screenshots of the 'EZ Sargassum' mobile application interface, illustrating the steps to add a new observation entry.

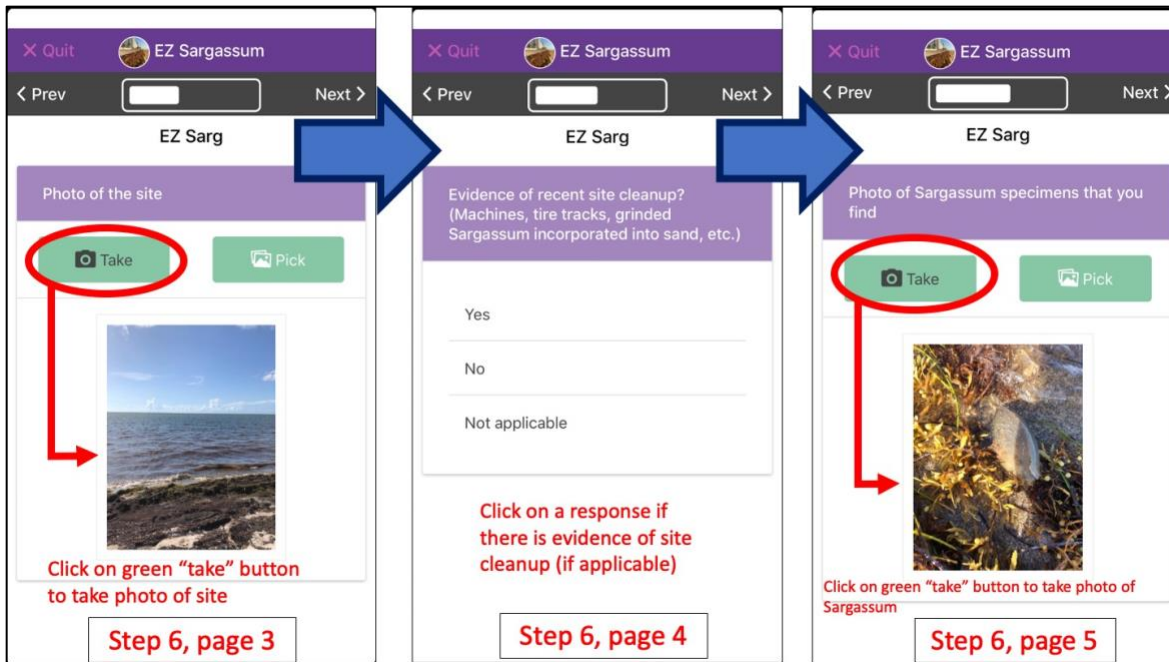
- Step 5:** The first screenshot shows the 'Projects' screen with a purple header. A red circle highlights the '+ Add entry' button in the top right corner. A red arrow points to it with the text 'Click on "Add entry"'. A box at the bottom is labeled 'Step 5'.
- Step 6, page 1:** The second screenshot shows the 'EZ Sarg' entry form. A red circle highlights the 'Date of Observation (dd/MM/YYYY)' field, which contains 'Aug 19, 2019'. A red arrow points to it with the text 'Click on text box. Today's date will be automated'. Below the field, a calendar view is visible, showing August 19, 2019, selected. A box at the bottom is labeled 'Step 6, page 1'.
- Step 6, page 2:** The third screenshot shows the 'EZ Sarg' entry form with the 'GPS Coordinates of Site' section. A red circle highlights the 'Update location' button. A red arrow points to it with the text 'Click on green "update location" button. In situ GPS coordinates will be automated'. A box at the bottom is labeled 'Step 6, page 2'.

Blue arrows indicate the flow from Step 5 to Step 6, page 1, and from Step 6, page 1 to Step 6, page 2. A red arrow also points from the 'Update location' button back to the 'Date of Observation' field.

Step 6.2: The next page will ask you to take photos of the site. For on-site observations, click on "Take." The screen should change to a camera to take the photo.

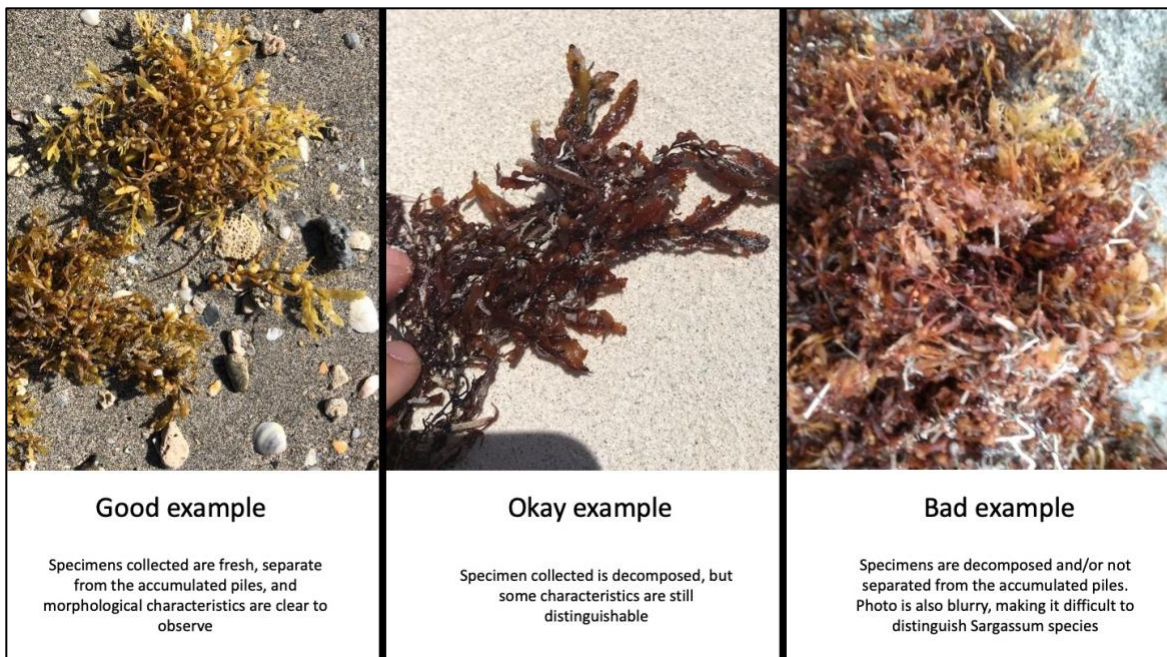
Step 6.3: The next page will ask if there is any evidence of site cleanup. This mostly applies to sandy beaches, although offshore cleanups can also happen. Evidence of site cleanup include, but are not limited to:

- Large tire tracks
- Trucks or tractors
- People raking Sargassum
- Sargassum buried and integrated into sand



Step 6.3: The next page will ask for one “photo of Sargassum specimens that you can find.”

It is preferred that you find fresh specimens of different types that you can distinguish. You also need to have the specimens distinct from each other and fit inside one photo. Example submissions and labeled quality are shown below:



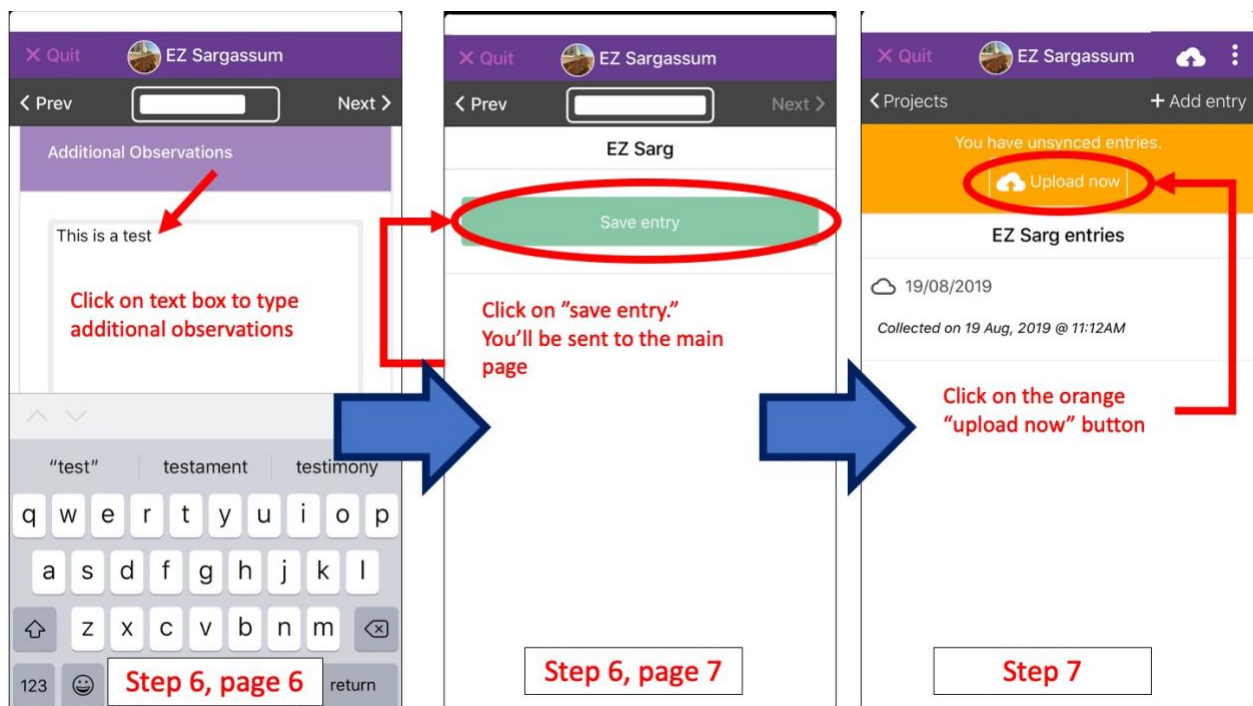
Example submissions of Sargassum specimens collected.

Step 6.4: The next page will ask for additional observations. You are free to type anything in this text box

Step 6.5: The last page will prompt you to click on “save entry.” Once you click on “save entry,” you will be lead back to the project screen with an additional orange window “You have unsynced entries” shown.

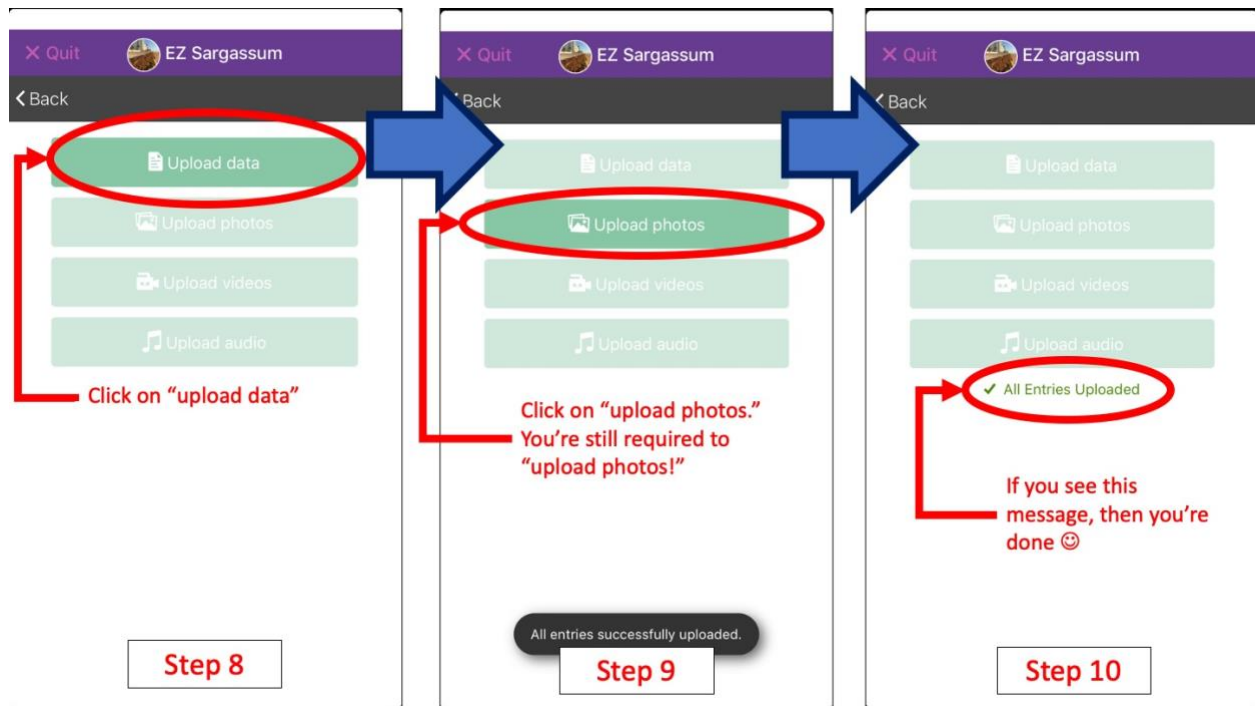
Step 7. You can save as many entries as you want. When you are ready to upload, click on “Upload Now” in the orange box.

Step 7.5: If you need to delete an entry that has not been uploaded yet (noted with a white cloud to the left), click on the entry. On the top right corner, click on “delete entry,” and confirm with “ok.” The entry should be deleted.



Step 8: Once you click on “Upload now,” you should see a page with a highlighted button asking to upload your data and photos. Click on “Upload data”.

Step 9: Once the data is uploaded, the app will give you a message “all entries successfully uploaded.” The button asking to “Upload Photos” should also be highlighted. Click on “Upload photos.” **This is required for your data entries to be complete.**



Step 10: All entries (including photos) should have been uploaded. Enjoy the rest of your day under the sun. 😊

Frequently Asked Questions and Troubleshooting

“I don’t see any Sargassum. Should I still upload an observation?”

Yes! Absence of Sargassum is still data, and seeing how the site changes over time is essential, especially should Sargassum make landfall one day.

“I am returning to the same site and seeing the same observation. Should I still upload an observation?”

Yes! Seeing how the same site changes over time is valuable information.

“Where can I observe mats of Sargassum?”

Most areas would be coastal, such as public beaches or state/federal parks. Other areas can include piers, bridges, marinas, or anywhere where the area has contact with the ocean. Sargassum is a pelagic, floating species that eventually washes onto shore, and can occur anywhere there is connection to the ocean.

“What species of Sargassum should I look for?”

The two species of Sargassum are *Sargassum fluitans* (*S. fluitans*) and *Sargassum natans* (*S. natans*). Within these two species however, are morphotypes, which are still the same species but can look very different from each other. The top 3 morphotypes of the two Sargassum species are shown below in the figure by Schell et al. (2015).



Do note that while these are the three most common species/forms of *Sargassum*, we have found other species or forms in common abundance in the past. If you see any unusual specimen in abundance, take a picture of it anyway. These findings can still be useful for monitoring of previously rare forms.

“I am intimidated with using this app. How do I know what buttons on the datasheet to push?”

Once you install the app, there is a “EC5 Demo Project” on the project homepage. The demo is optional, but it is good for getting acquainted with the types of questions and inputs to expect in the app. The layout for the EZ Sarg project is the same as any other Epicollect5 project, including the demo. The breakdown of step 6 also follows the data sheet step-by-step.

“What questions does the data sheet in the project consist of?”

The first part of the data sheet will ask you for general information, such as date and location. The following questions will ask you to take photos of your observed site and the *Sargassum* specimens. Getting photos of the *Sargassum* specimens requires **picking up a few pieces of**

Sargassum and taking **one photo** of all specimens simultaneously. The data sheet wraps up with a text box for additional observations.

“I have a previous observation of Sargassum. How could I record that?”

You can still use the app to upload your observations, photos included. The only additional steps to take is to adjust the date and time of the observation manually, as the app can only automatically record today’s date and time. GPS Coordinates should also be skipped. The remaining steps to follow are the same.

“The app is not connecting. How could I upload the entry.”

The app requires internet connection and may not upload immediately. Saving the entry will keep it on your entry page, and you can upload it on a later time when you have more stable internet connection.

“I still cannot upload the entry and I have internet connection.”

You can email the photos, with all observation details to this email: lipor001@fiu.edu. We will confirm to you once we receive your observation.

“Do you have a website that shows the project itself?”

Yes! Follow this website link: <https://five.epicollect.net/project/ez-sargassum/data>. This website is automatically generated from the app. You can even see the data collected by clicking on “View data.”

“Do you have this app/project in _____ (language other than English)?”

We are developing a Spanish equivalent of “EZ Sargassum” that will be eventually be in the Epicollect5 project search. The steps to follow are identical to the English version. We also plan in the future to have the app in French and Dutch for specific Caribbean countries with those dominant languages.

“How can I contact you for any other questions?”

You can email the Ph.D Candidate, Lowell Iporac at lipor001@fiu.edu.

References used:

Schell, J., Goodwin, D. & Siuda, A. 2015. Recent Sargassum Inundation Events in the Caribbean: Shipboard Observations Reveal Dominance of a Previously Rare Form. *Oceanography*. 28:8–10.